THE IRON TRADE REVIEW

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RAILROAD BUYING

WAS AN IMPORTANT FACTOR OF THE WEEK.

Contracts for Cars and Rails — Reports of Price Cutting Exaggerated, but Have Depressing Effect.

Recent reports of price cutting, some of which have been exaggerated, and announcements of agreements to cut prices, which are without foundation, have had a depressing effect on the market. No action looking toward a general reduction in prices has been taken, and the situation as reported last week is unchanged. Some very good railroad business has developed, and specifications on nearly all lines are fair. The first steel was made at the great Gary plant this week, three open-hearth furnaces having been started Monday.

Pig Iron Conditions

Dullness still continues to prevail in pig iron. When a slight increase in sales is noted, as in Chicago the past week, somewhat lower prices prevail. Although southern furnaces are still holding to $13 Birmingham for No. 2, iron can be purchased from middlemen without difficulty at $12.50. Lower prices are reported in southern Ohio.

Pipe and Shapes

Specifications on merchant pipe are coming in very satisfactorily, and the outlook for tubular goods is excellent. Kansas City has contracted for 9,000 tons of cast iron pipe from the leading interest. The demand for cast iron pipe has improved in New England, but prices are low. Structural contracts include 5,000 tons taken by the Hay Foundry & Iron Works for three buildings. One of the important contracts in the east, which will probably not be placed for several months, is 12,000 tons for the Gimbel store building. The Patriot Realty Co., St. Louis, has contracted for 900 tons of Bethlehem shapes for building in that city.

Railroad Buying

The 80,000-ton New York Central rail order has been apportioned about equally between the independents and the Steel Corporation. The Illinois Steel Co. was allotted 23,000 tons, and the Carnegie Steel Co., 19,000 tons. Other rail sales include: 10,000 tons for the P. & L. E., taken by the Carnegie Steel Co.; 6,200 tons for the El Paso & Southern railroad, taken by the Colorado Fuel & Iron Co.; 1,400 tons for the New Orleans & Northeastern, by the Illinois Steel Co.; 1,000 tons for the Toledo, Peoria & Western, and 1,225 for the Chicago & Oak Park Electric. The Pennsylvania railroad for its service east of Pittsburg has placed orders for 2,404 all-steel gondolas, of which the Cambria Steel Co. will build 1,404 and the American Car & Foundry Co., 1,000. It is understood that very low prices were named on these cars. The New York Central has about closed on a part of its inquiry for 2,000 stock cars and 2,000 box cars with steel underframes. Recent placing of orders for steel cars has had the effect of increasing specifications on plates, but cutting of prices is still in vogue.

Coke and Old Material

The scrap market is dull, and prices are lower in New York, Cleveland and Pittsburg. Coke is weak, and efforts to reduce production have had little effect.

The Employers' Association of Cleveland will meet Feb. 18 at 6:30 o'clock at the Hollenden, when the annual meeting and dinner will take place. Invitations have been extended to 2,000 employers of labor to participate.

LEND A HAND

TO THE NEW ADMINISTRATION, SAYS JUDGE GARY,

Who Dwells Upon the Duty of Every Citizen—Mr. Carnegie Predicts That the Government Will Eventually Regulate Prices.

Judge Elbert H. Gary, chairman of the board of directors of the United States Steel Corporation, was the guest of honor at a dinner tendered Feb. 11, by the Illinois Society of New York in that city. He said in part:

I wish to emphasize the point that every citizen in this great country shares in the responsibility for conditions and results to an extent corresponding with the claim for himself when he talks about the power and authority and control and sovereignty of the people. If the leading men would at all times show a disposition to harmonize and work with those who are elected to positions of public trust, assuming individual responsibility for the character and reputation and the moral and material conditions of the nation, instead of resorting to complaint and condemnation of official action, sometimes even defying the law itself, the grounds for unfavorable criticism of government management would disappear.

We snarl at the legislator or the chief executive if any action is taken or word spoken which we think is calculated to injure vested rights in property, but we are apt to overlook the fundamental principle that even vested rights, so-called, must yield whenever they become antagonistic to the public welfare and safety; that the rights of the individual are subordinate and must submit to those of the public. The public well-being and safety may be involved in many of the acts of the citizen, including even the control and management of his own private property and business. It is not necessary to amplify nor to be more explicit in order to make the point clear.

It is a good time for all of us to decide that at the outset of the new administration we will use every effort, not only to conform to the laws of the land in every respect, but to recognize our individual responsibility, and to lend our efforts to advance the interests of the public

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THE WEEK IN IRON CENTERS

PITTSBURG.

Pig Iron, Coke and Old Material Dull —Price Discussions.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., Feb. 16.

While it does not appear upon close observation that the trade in iron and steel products has reached the serious straits which some current reports indicate, it is evident that the general situation is being greatly retarded by certain influences present. Running orders, although of steady volume as in the recent past, are not increasing and the attitude of the buyer continues that of closely guarding himself against obligations into the extended future.

The lack of faith in anticipating requirements is held to be due largely to a doubt over the stability of present iron and steel prices, upon which the unsettled tariff question is having a strong bearing. Similarly, the concessions which some independent companies are making is having the effect of arousing the caution of consumers.

In this respect, the industry at present is apparently suffering from the ills of the market which date back a number of months. Though the shading under way is causing louder comment at this stage, it is not conclusive that the willingness of certain interests to accept orders below official quotations originated shortly before the present clamor in the market over this fact. In some quarters at least, the practice has been pursued for a considerable time and there are buyers who declare that they are now able to obtain no better inducements than it was possible to command on attractive business months ago. The difference may be stated that, under present conditions, there is probably less disposition to cover tracks from those upholding the market and it is an open question whether the scope of the increase in this underselling activity has not been exaggerated.

The past week has shown no especial developments in finished lines. Pig iron, coke and old material continue dull and weak.

Pig Iron.—The pig iron market is absolutely without life. Needs of melters are being expressed in carloads and slightly larger tonnages and there is a noticeable lack of business being offered for extended shipment. Some steel companies which will evidently soon be in need of iron are keeping in touch with the market, but are withholding their orders in the hope of lower prices.

The foundry iron market, which recently weakened 50 cents to a $15 valley basis, is firm at that level for straight No. 2 iron and there is a disposition in some quarters to contend that the recent decline was not justified by the attending circumstances. Occasionally higher prices are being commanded. The transaction of 150 tons of No. 2 for delivery to July 1 on a basis of $15.35 valley is reported. Several small sales of prompt Bessemer were made this week at the customary price of $16 valley. Malleable is being quoted around $15.25 valley. There is some demand from New England. Basic is at $15 valley and quite steady at that quotation. Of the 17 merchant furnaces in the valleys, 10 are in blast.

The southern market as noted in this district ranges from $12.50 to $13 Birmingham. Some purchases have been made here at the former price and transactions have also been closed at $12.75. An Ohio interest is reported to have closed for 500 tons of No. 2.

On prompt and first quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$16.00 to 16.50
Bessemer, Pittsburg	16.90 to 17.40
No. 2 foundry, Pittsburg	15.90 to 16.15
Gray forge, Pittsburg	15.25 to 15.50
Basic, valley	15.00 to 15.25
Basic, Pittsburg	15.90 to 16.15

Ferro-Alloys.—The market continues dull and prices are largely nominal. The indications point to a slightly better tone in 50 per cent ferro-silicon. We quote nominally 80 per cent ferro-manganese at $44 seaboard with a freight rate of $1.95 to Pittsburg.

Imported 50 per cent ferro-silicon is quoted at $62 to $62.50 Pittsburg on forward deliveries; domestic 12 per cent, $27; 11 per cent, $26; 10 per cent, $25 Pittsburg.

Plates.—Some of the plate mills report increased specifications this month over a corresponding period in January, the gain in orders being due mainly to a livelier demand by the steel car companies. The Pittsburg-Buffalo Co. is buying 1,000 all-steel mine cars which will be divided among the Pressed Steel Car Co., Standard Steel Car Co., Ralston Steel Car Co., and the Watt Mine Car & Wheel Co., Barnesville, O., and a large portion of the steel required will come from the Carnegie Steel Co. The latter is now rolling tonnage for the Brooklyn waterworks improvement. There are several riveted pipe projects in the country in contemplation. The five-year plate contract between the Pressed Steel Car Co. and the Carnegie Steel Co. expired Feb. 14, and though no announcement of any renewal has been made, it is expected that the former company's requirements will continue to be supplied from the same source. Some shading of plate prices is current. We quote officially:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.60c, f. o. b. mill Pittsburg. Extras are as follows per 100 pounds. Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—Some improvement in specifications is reported by sheet makers, but the market is still considerably disturbed by the shading of prices by some independents, which is especially marked in the corrugated product. Some of the electrical companies are operating quite actively and are consuming a very fair tonnage. The expanded metal lath makers are also providing a good demand. An order for 55 tons of iron and steel sheets for building construction in this district has been closed, and another for 170 tons is pending. The American Sheet & Tin Plate Co. slightly increased its operations this week and is running 48 per cent or 86 mills, compared with 43 per cent or 80 mills the previous week. The general average of operation among the independ-

ents of the country is about 70 per cent. We quote officially as follows:

Blue annealed sheets, No. 10 and heavier, 1.80c; Nos. 11 and 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 2c; box annealed, Nos. 17 to 21, 2.25c; Nos. 22 to 24, 2.30c; Nos. 25 and 26, 2.35c; No. 27, 2.40c; No. 28, 2.40c; No. 29, 2.60c; No. 30, 2.70c; galvanized sheets, Nos. 10 and 11, 2.45c; No. 12 and 14, 2.55c; Nos. 15 and 16, 2.65c; Nos. 17 and 21, 2.80c; Nos. 22 and 24, 2.95c; Nos. 25 and 26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.70c; No. 30. 2.95c; corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation, and $3.10 per square on galvanized roofing, 2½-inch corrugation, No. 28.

Jobbers are allowed $1 a ton from these prices.

Tin Plate.—An interesting feature of the market for tin mill products is the steady consumption of material by the enameled ware makers, who are enjoying practically a normal demand for their goods. The fruit and vegetable canners are closing with the tin can manufacturers for their annual requirements, and the latter are expected soon to place their contracts for plate material. The Pacific coast fish packers are specifying very well against tin plate contracts. There is some shading in tin plate and tin mill products. The leading maker continues to operate 164 mills or 68 per cent. Most of the independents are working at 90 per cent and better. We quote official prices as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.70 f. o. b. mill Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The Carnegie Steel Co. has closed with the Pittsburg & Lake Erie railroad for 10,000 tons of standard sections and rolling orders are expected to be filed soon. While the steam lines are contracting for relatively small tonnages for quick shipment, there are a large number of traction and incidental steam line projects under consideration in the country which are expected to reach the market with more favorable financial conditions, and this fact is causing rail makers to entertain a hopeful view of the future. A good demand for light rails continues, and bookings of the week of the Carnegie Steel Co. reached 2,000 tons. The Pittsburg-Buffalo Co. recently placed with the Carnegie company an order for 1,000 tons of 20 to 60-pound sections for coal mining operations. The re-rollers are quoting around $23 on 25 to 45-pound rails and where necessary this competition is being met by the mills rolling from billets. The rail mills at the Edgar Thomson works are operating steadily at a greater percentage of capacity than for many months. On present specifications on Bessemer rails, we quote as follows, the base price for open-hearth rails being $30 mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $32; 12-pound, $29; 16-pound, $27; 20-pound, $26; 25 to 45-pound, $25; angle splice bars for standard sections, $1.65; standard spikes, $1.70 to $1.80 Pittsburg; hand spikes, $1.80 to $1.90 Pittsburg.

Steel.—Users of semi-finished steel are specifying quite well against contracts, but new business is only in occasional odd lots. Forging billets are being taken in good volume. Some large makers of sheet bars are not actively soliciting business, as specifications against present contracts are keeping their mills moderately active.

Bessemer and open-hearth billets, base sizes, are quoted at $25 Pittsburg, and forging billets at $27 Pittsburg, subject to the division of the freight charge over $1 and not exceeding $2, and sheet and tin bars at $27.50 Pittsburg, valley and Wheeling territory, and $27 Pittsburg for delivery to other points.

Hoops and Bands.—There is practically no new contracting in hoops, and the temperance agitation in different parts of the country has seriously disturbed the cooperage trade. Specifications are only fair. There is shading of hoop prices. Official prices are as follows:

Hoops in carload lots, 1.80c; in less than carload lots, 1.90c; bands, 1.40c, base half extras as per standard steel.

Merchant Bars.—While little difficulty would probably be encountered in obtaining price concessions from certain mills on attractive steel bar business, this market appears somewhat firmer than other iron and steel products. Some of the principal makers are holding consistently to the 1.40c Pittsburg basis. Little new business is being offered and specifications against old contracts are moderate but steady, representing actual consumptive needs. There is more inquiry and activity in reinforcing bars. Bar iron is not active, but is steady at the official level in this district. We quote officially:

Common iron bars, 1.50c Pittsburg in carload lots and over; 1.55c in less than carloads, 1.32c to 1.35c base Pittsburg, plus freight to point of shipment on western deliveries; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3-inch, 1.50c; all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 57 per cent in carloads, and 52 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.60c base. Iron finished tire under 1½ by 1½ inches, 1.55c, plus ½ extra on tire card; iron finished tire, 1½ by ½ and over, 1.40c, plus ½ extra on the steel tire card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.35 on hard, and $3.60 on soft.

Structural Material.—There is a disposition to ask for prices on structural jobs, but to hold up the making of final awards because of general uncertainties. The inquiry is only fair. The situation continues unsatisfactory to fabricators, owing to the low prices being made in competition, which have been rendered possible by concessions being granted by some makers of plain material. No awards of importance were made in this district the past week, but several matters are hanging fire. The West Penn hospital addition, for which bids have been taken, will undergo some radical revision in plans which will delay that award. The commissioners of Allegheny county are considering the erection of a courthouse annex to relieve congested conditions in the present building. Official prices are as follows:

Beams and channels, 15-inch and under, 1.60c; over 15 inches, 1.70c; zees, 1.60c; tees, 1.65c; angles from 3 to 6 inches, 1.60c; over 6 inches, 1.70c; universal and sheared plates, 6¼ inches, and wider, 1.60c base.

Merchant Pipe.—Good specifications in merchant pipe are being received from the jobbing and consuming trade, and this material is going directly into use, as small stocks are being carried. There is little doing in line pipe operation, and several important inquiries which have been in the market are still pending. It is stated that the outlook for tubular goods has never been better, as there are many undeveloped propositions under way which will require a large tonnage. Prices are reported as firm. We quote

the following official base discounts subject to five off to jobbers, while a few of the very large jobbers with mill connections are given an additional one point off:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
¾ to 6 inches....	75	65	73	63

Boiler Tubes.—A waiting market prevails in tubes, as current business and orders in both locomotive and merchant tubes are light. We quote the following official discounts to the general trade on base sizes:

BOILER TUBES.

	Iron.	Steel.
2¼ to 5 inches.....	52	65

Wire Products.—The market is without particular interest at the present dull season and is moving quietly. Specifications for nails and wire from the jobbers and plain wire from the manufacturers are moderate. Manufacturers are expecting a good spring trade. Wire prices are reported to be well maintained. The Youngstown Sheet & Tube Co. during the past week started its enlarged rod and wire mills at its Struthers, O., works, and by so doing has become a more prominent maker of plain and galvanized products. We quote official prices as follows:

Wire nails, jobbers' carload lots, $1.95; retailers' carload lots, $2; painted barb wire, jobbers' carload lots, $2.10; retailers' carload lots, $2.15, with 30c for galvanizing; plain wire to jobbers in carloads, 1.80c and to retailers in carloads, 1.85c.

Wire Rods.—No new business of importance is being placed in rods. Consumers are specifying moderately against standing contracts. Prices are unchanged, and we quote $33 Pittsburg on Bessemer and $34 Pittsburg on open-hearth rods.

Coke.—The weakness which has prevailed in the coke market for the past six weeks is still apparent. While there is a further curtailment of production in certain quarters, some furnaces are not taking their requirements as fully as expected, and considerable material is being left to find a market. On the other hand, it is reported that a better condition prevails as to bargain offerings by middlemen. We quote the spot market on high grade furnace coke at from $1.60 to $1.75 ovens and on contract from $1.75 to $1.90 ovens. On first class Connellsville foundry coke for shipment up to the second half, the price range is from $2 to $2.25 ovens. Beyond that time a higher price is asked. The total production in the Connellsville regions is showing a very slight decrease. The *Courier's* figures for the week ending Feb. 6 show 24,112 active ovens with a production of 262,156 tons compared with 23,564 active ovens and a production of 265,514 tons the previous week.

Old Material.—The general weakness in the old material market continues and transactions are at a lower level. Though there are plenty of offerings to cover the light current demand, these are not greatly excessive, as some of the dealers still show reluctance to part with their stocks. There is a ready acceptance of the market prices for all grades offered, however. The Pittsburg Steel Co. continues to be a principal consumer of scrap in this district under present conditions although several other mills are melting in favorable proportions. We quote gross tons delivered in the Pittsburg district as follows:

Heavy melting scrap, $15.25 to $15.75; re-rolling rails, $16.50 to $17; bundled sheet scrap, $12.50 to $13; iron axles, $20 to $21; old iron rails, $17.50 to $18; No. 1 wrought scrap, $16 to $16.50; old car wheels, $15.75 to $16.25; low phosphorus, $17.50 to $18; machine shop turnings, $10.50 to $11; cast borings, $8.50 to $9.50; No. 1 cast scrap, $14 to $14.50; malleable, $14 to $14.50; stove plate, $11 to $11.50.

CHICAGO.

Slight Increase in Pig Iron Sales—New York Central Rail Tonnage.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Feb. 16.

In its present condition the market is featureless save for the pronounced discontent which pervades the ranks of both producers and consumers of finished steel products with regard to prices. The disturbing of trading connections of many years' standing because of the irregular prices current has produced an unfortunate atmosphere of suspicion and counter charges which is absorbing more interest than the transactions that are being negotiated. New business in all lines is woefully thin. Specifications on iron and steel bars and wire products are, however, very good as compared with the general volume of business. The rail market brought out little of interest, but about 25,000 tons is reported pending in this territory. Weakness is shown more particularly in connection with structural steel, plates and sheets in which lines orders are few and prices are subject to severe shading. Pig iron received some support during the week by the purchase of a few fair size tonnages of northern iron. The market for old material is without strength and inactive.

Pig Iron.—Through coincidence and the fact that it was possible to obtain some concessions in price, a better tonnage of northern iron was placed last week than for several weeks previous. The total was of course only large by comparison, but of the 6,000 tons reported placed, 5,000 tons was made up of but three or four orders. A fair proportion of this was taken by one or two malleable interests. Another order for 1,000 tons was placed, the price being $17 local furnace. This price has been regularly shaded, however, on shipments from both Milwaukee and Chicago and the market is unquestionably as low as $16.50 on several brands of iron. The southern situation was less active, but on southern iron, concessions from the open quotations of $13 for No. 2 at Birmingham are being made also. There is apparent no general improvement in the buying though the inquiry from a few interests more favored with business enlivened somewhat an otherwise apathetic week. We quote Birmingham and local furnace prices as follows:

Lake Superior charcoal	$19.50 to 20.00
Northern foundry No. 1.....	17.00 to 17.50
Northern foundry No. 2.....	16.50 to 17.00
Northern foundry No. 3.....	16.00 to 16.50
Southern foundry No. 1.....	17.35 to 17.85
Southern foundry No. 2.....	16.85 to 17.35
Southern foundry No. 3.....	16.35 to 16.85
Southern foundry No. 4.....	15.85 to 16.35
Southern No. 1 soft.....	17.35 to 17.85
Southern No. 2 soft.....	16.85 to 17.35
Southern gray forge.....	15.85 to 16.35
Southern mottled	15.60 to 16.10
Southern silveries, 4 per cent silicon	18.10 to 18.60
Southern silveries, 5 per cent silicon	18.60 to 19.10
Southern silveries, 6 per cent silicon	19.10 to 19.60
Jackson Co. silveries, 6 per cent.	19.90 to 20.40
Jackson Co. silveries, 8 per cent.	20.90 to 21.40
Jackson Co. silveries, 10 per cent	21.90 to 22.40
Malleable Bessemer	17.00 to 17.50
Standard Bessemer	17.90 to 18.40
Alabama basic	17.35 to 17.85

Billets.—Orders for billets other than what is being taken on contract are not of such character as to attract attention and the general aspect of the market lacks interest in this respect. There is no particular pressure on prices at this time and we quote as follows: 4 x 4-inch rolling billets $26.50, forging billets, $23.50 base Chicago.

Merchant Bars.—The general bar situation is firm and departures from the scheduled prices are the exceptions. Specifications for both iron and steel bars during the month as compared with January are improved. New orders are few, but the purchase, advantageously, of 5,000

tons of steel bars by a Michigan City, Ind., interest a few weeks ago is just now announced. The contract was placed with a mill adjacent to Chicago. Specifications and inquiry for machinery steel and implement steel appear to be more hopeful. Contrasted with other finished products, the situation with regard to merchant bars is very fair. We quote Chicago delivery as follows:

Bar iron, 1.50c to 1.53c; soft steel bars and bands, 1.58c, half extras; soft steel angles, less than 3 x 3, 1.68c; hoops, 1.98c base, full extras; planished or smooth finished tire steel, 1.78c; iron finish, up to 1½ x ½-inch, 1.73c base tire card; iron finish, 1½ x ½-inch and larger, 1.58c base steel card; channel for solid rubber tire, ¾ to 1 inch, 2.08c; and 1⅛-inch and larger, 1.98c; smooth-finished machinery steel, 1.83c; flat sleigh shoe, 1.63c; concave and convex sleigh shoe, 1.83c; cutter shoe, 2.95c; toe calk steel, 2.13c; railway spring, 1.93c base steel card; vehicle spring steel, 1.98c base vehicle card; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 56 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.90c to 2c, full extras; soft steel bars, 1.80c per 100 pounds base, plus half extras; soft steel hoops, 2.30c full extras.

Plates.—Those interests which are committed to the nominal schedule of prices are to all intents out of the market on plates. Concessions of as much as $3 a ton have been offered on comparatively small tonnages and the major portion of the small tonnage moving is placed at from $1 to $2 below the market. The situation is decidedly weak. We quote for Chicago delivery as follows:

Plates, ¼-inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.78c Chicago. For extras see Pittsburg report. Shippers' prices for shipment from local stocks are as follows: Tank steel, ¼-inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3/16-inch up to and including 60 inches wide, 2.10c to 2.15c; 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.10c to 2.15c. Flange and head quality, 25c extra.

Sheets.—Some prospect of business in sheets seems to be developing in the northwest and local territory, but interest generally is lacking; whether because consumers actually do not need the material or are not satisfied with prices, is difficult to determine satisfactorily. While concessions of $1 a ton are heard of, a local interest reports the placing of 125 tons of sheets this week at full prices. We quote store prices; for mill prices see Pittsburg report:

No. 10, 2.15c to 2.25c; No. 12, 2.20c to 2.30c; No. 14, 2.25c to 2.35c; No. 16, 2.35c to 2.45c; Nos. 18-20, 2.60c to 2.65c; Nos. 22-24, 2.65c to 2.70c; No. 26, 2.70c to 2.75c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.95c; No. 30, 3.25c; galvanized sheets, Nos. 10 to 16, 3.05c to 3.10c; Nos. 18 to 20, 3.15c to 3.25c; Nos. 22 to 24, 3.30c to 3.35c; No. 26, 3.50c to 3.55c; No. 27, 3.70c to 3.75c; No. 28, 3.90c to 4c; No. 30, 4.40c to 4.50c.

Structural Steel.—The contracts for structural steel negotiated during the week include one for 990 tons of Bethlehem shapes for a building built by the Patriot Realty Co., St. Louis, for the Roberts-Johnson-Rand Shoe Co. The general contract for this job is in the hands of Jas. Stewart & Co. and the fabricating will be done by the Richards-Noelke Co. of Indianapolis. The same company will fabricate 250 tons of Bethlehem shapes for the First National Bank building at Fort Smith, Ark., for which the Jas. Black Masonry & Contracting Co. are general contractors. The Bethlehem Steel Co. will furnish 450 tons of girders for the Soo Line at St. Paul. The city of Spokane, Wash., let the contract for 159 tons of bridge steel to the Interstate Engineering Co., Bedford, O. A school building at Neosha, Minn., will be erected by the Crown Iron Works, Minneapolis, which took the contract for 50 tons. The American Bridge Co. took an aggregate of about 650 tons of miscellaneous steel work for the mines of the Steel Corporation in Minnesota and contracts are about to be closed for the steel for the washing plant and trestle for Coleraine. About 6,000 tons of steel will be required for this. The American Bridge Co. also took last week about 1,400 tons of forgings. The Chicago, Milwaukee & St. Paul railroad has out an inquiry for about 200 tons of bridge steel. Prices are very irregular. We quote for Chicago delivery as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.75c to 1.81c, delivered Chicago. For extras see Pittsburg report. Quotations from store are as follows for carload lots and over:

All angles, 3 inches and larger, including 6 inches, $1.95 per 100 pounds; angles over 6 inches, $2.05 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.95 per 100 pounds, base; channels, 3 inches and larger, $1.95 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The railroad situation continues quiet from a buying standpoint. There was placed last week but 1,400 tons for a southern road out of New Orleans, taken by the Illinois Steel Co., and 6,200 tons for the El Paso & Southern railroad taken by the Colorado Fuel & Iron Co. The distribution of the 80,000-ton order from the New York Central lines resulted in the placing of a total of 23,100 tons with the Illinois Steel Co. of which 700 tons is for laying in Canada. The balance awarded to the Steel Corporation went to the Carnegie Steel Co., amounting to 19,000 tons. No further orders for track material are reported. We quote as follows:

Standard Bessemer rails, $28; open-hearth, $30, f. o. b. mill in 500-ton lots and over; less than 500 tons, $2 extra, full freight to destination; light rails, 25-pound to 45-pound, $25; 20-pound $27; 16-pound, $28; 12-pound, $29. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; spikes, 1.80c to 1.90c; track bolts, with square nuts, 2.15c to 2.25; with hexagon nuts, 2.30c to 2.40c. Small railroad and square boat spikes, 1.90c base, f. o. b. Chicago.

Merchant Pipe and Boiler Tubes.—The buying of tubular goods in the past week, although greatly scattered and without any definite character, was an improvement over the conditions of the several weeks preceding. Prices are well maintained and we quote mill discounts as follows:

	—Steel—	
	Black.	Galv.
¼ to 6 inches, inclusive.....	73.2	63.2
7 to 12 inches, inclusive.....	70.2	55.2

BOILER TUBES.

	Steel.	Iron.	Seamless.
2¼ to 5 inches, inclusive..	63.2	50.2	50.2

Cast Iron Pipe.—The only transaction of importance during the week was the placing of the contract for 9,000 tons of pipe by Kansas City with the United States Cast Iron Pipe & Foundry Co. There have been no changes in price and we quote, 4-inch water pipe, $28; 6 to 14-inch $27; larger sizes, $26; gas pipe, $1 a ton higher.

Wire Products.—The tonnage of barb wire and wire nails is somewhat behind the other wire products, but the aggregate of specifications and new contracts compares exceedingly

well with other lines of products in the market and is well up with the average of last year. There seems to be no desire on the part of retailers and jobbers for lower prices in wire products at this time and the market is firm. We quote as follows:

Wire nails, jobbers' carload lots, $2.13; retailers' carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.28; retailers' carload lots, $2.33, with 30c for galvanizing; plain wire to jobbers in carloads, 1.98c, and to retailers in carloads, $2.03. Wire rods, Bessemer, $33; open-hearth $34; chain rods, $33, f. o. b. Pittsburg.

Old Material.—Inactivity prevails in the scrap market. Transactions are few in number, covering the movement of odds and ends, most of which are being handled at sacrifices. Dealers are not disposing of any of the material that has been held in stock, at the present prices, and as the railroads are also inclined to withhold their scrap until the situation improves, it is difficult to buy any considerable tonnage of the standard grades at low prices despite the weakness in the market. We have revised our prices and quote gross tons in the first paragraph as follows:

Old car wheels	$15.00 to 15.50
Old iron rails	18.25 to 18.75
Re-rolling rails (4 ft. and over)	15.00 to 15.50
Old steel rails (4 ft. and under)	14.50 to 15.00
Light section relayers, 45 lbs. and under, subject to inspection	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards	13.75 to 14.25
Heavy melting steel	13.75 to 14.25

We quote, net tons, as follows:

No. 1 R. R. wrought	$13.00 to 13.50
No. 2 R. R. wrought	12.00 to 12.50
Knuckles, couplers and springs	12.75 to 13.25
Shafting	15.75 to 16.25
Iron car axles	18.50 to 19.00
Steel car axles	17.75 to 18.25
Dealers' forge No. 1	10.25 to 10.75
Pipes and flues	9.75 to 10.25
No. 1 cast, 150 lbs. and less	12.75 to 13.25
No. 1 mill	7.75 to 8.25
Mixed busheling (Nos. 1 and 2)	7.75 to 8.25
Country sheet	5.50 to 6.00
No. 1 boiler cut	9.75 to 10.25
Boiler punchings	12.00 to 12.50
Cast borings	6.50 to 7.00
Mixed borings, etc	6.50 to 7.00
Machine shop turnings	8.00 to 8.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.00 to 11.50
Stove plate and light cast scrap	11.75 to 12.25
Old iron splice bars	15.50 to 16.00

CLEVELAND.

Pig Iron and Finished Lines Dull—Still Lower Scrap Prices.

Office of THE IRON TRADE REVIEW,
Browning Building, Feb. 16.

Iron Ore.—No transactions in iron ore are reported, and it is not expected that there will be any until the future course of the pig iron market becomes more clearly defined.

Some additional contracting for carrying ore has been done at last season's rates—65 cents from the head of Lake Superior, 60 cents from Marquette and 50 cents from Escanaba—and it is probable that these rates will rule throughout the season, although it is known that some vessel interests, which were not very prosperous last season, are eager to get more business, and it is possible that the rate may be cut later.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—An inquiry for 300 tons of malleable by a northern Ohio interest outside of Cleveland, and one for 1,000 tons of basic in the same territory are the only inquiries of any importance recorded. Reports as to the present melt of foundries are conflicting, as some foundries have considerably more business than others. We quote delivered in Cleveland as follows:

No. 1 foundry	$16.75 to 17.00
No. 2 foundry	16.25 to 16.50
No. 3 foundry	15.75 to 16.00
No. 2 southern	16.85 to 17.35
Gray forge	14.00 to 14.50
Bessemer	16.90 to 17.15
Lake Superior charcoal	19.50 to 20.00
Jackson Co. 8 per cent silvery	20.05

Coke.—No improvement is noticeable in the coke market, as some low prices are being named for spot coke, and very little contracting for future delivery is being done. We quote standard foundry coke on contracts $2.25 to $2.40 and furnace coke on contracts $1.75 to $1.85. For prompt delivery we quote furnace coke at $1.50 to $1.60, and foundry at $2.00 to $2.25.

Finished Materials.—Recent concessions on prices and rumors of a general reduction have had a disturbing effect on the market, but specifications against contracts are coming in in fair volume. Cutting on sheets and plates in this territory seems to be confined to a few of the smaller independent interests. Some of the contracts for the new blast furnace of Corrigan, McKinney & Co. have been awarded; the furnace dock will be built by Hunkin Bros. Construction Co.; the contract for the ore bridge was awarded to the Brown Hoisting Machinery Co., and for the unloading machines to the Wellman-Seaver-Morgan Co. The contract for the furnace proper has not yet been awarded. Work on the foundation will be begun immediately. The demand for bar iron is very limited, but both the Cleveland mills are in operation.

Old Material.—The continued dullness of the market locally has had the result of further softening prices. Local mills are taking but small quantities of material and immediate prospects are not brightening. Reductions in both iron and steel material prices have been made ranging from 50 cents to 75 cents a ton. We quote f. o. b. Cleveland as follows:

Old iron rails	$17.50 to 18.00
Old steel rails (re-rolling)	15.50 to 16.00
Old steel rails (under 6 feet)	15.50 to 16.00
Old car wheels	15.00 to 15.50
Old steel boiler plate	12.50 to 13.00
Malleable iron (railroad)	14.50 to 15.00
Steel axles	19.50 to 20.00
Malleable iron (agricultural)	13.50 to 14.00
Heavy steel	14.50 to 15.00
Country mixed steel	13.50 to 14.00
Low phosphorus	17.00 to 17.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$15.00 to 15.50
No. 1 busheling	13.00 to 13.50
No. 1 machine cast	13.50 to 14.00
Iron axles	19.00 to 19.50
Axle turnings	10.00 to 10.50
Machine shop turnings	8.50 to 9.00
Grate bars	12.00 to 12.50
Pipes and flues	11.50 to 12.00
Tank iron	11.50 to 12.00
Hoop and band iron	8.50 to 9.00
Sheet iron	8.00 to 8.50
Wrought drillings	8.50 to 9.00
Stove plate	12.00 to 12.50
Cast borings	7.50 to 8.00

CINCINNATI.

Inquiries Develop Concessions From Furnace Quotations.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Feb. 16.

Pig Iron.—The market continues dull with sales confined to small purchases, mainly carloads. Inquiry is insignificant so far as foundry iron is concerned, but a melter in northern Ohio is figuring on 1,000 tons of basic, for delivery in the next four months. A sale of 400 tons of malleable iron is said to have been made by a Toledo furnace to a melter in that territory. These are the only transactions worthy of mention in this market. The price situation has become more irregular, but low quotations are credited to resale irons and not to the furnaces. It is said in the trade, however, that one southern Ohio furnace has quoted on the basis of $15.25 for No. 2 foundry. It is also general talk that prices are coming from some source of $15 at furnace in southern Ohio and even less. Southern irons have been sold at $12.50 Birmingham by speculative interests and the market is getting into a position where inquiries involving any important tonnage bring out prices about 50 cents under the furnace quotations. It is difficult to locate these sales and when prices are given out it is claimed that the sale was on an analysis instead of fracture. The conditions described give

the market a weak tone and while furnaces, especially the southern producers, appear to resist meeting resale iron figures, it is believed in the trade that lower prices are inevitable on prompt shipment iron. What may be done on forward deliveries does not seem to be indicated. For the present, prompt shipment iron is the interesting feature and under the conditions prevailing buyers would find but little inducement to cover second quarter at present schedules. An improvement in general business and an increase in the melt would be influential in steadying the situation, but the outlook at present is unfavorable for higher prices. We quote for prompt delivery, delivered Cincinnati, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

Southern foundry No. 1	$16.25 to 16.75
Southern foundry No. 2	15.75 to 16.25
Southern foundry No. 3	15.25 to 15.75
Southern foundry No. 4	15.00 to 15.25
Southern No. 1 soft	16.25 to 16.75
Southern No. 2 soft	15.75 to 16.25
Southern gray forge	14.75
Northern No. 1 foundry	17.00 to 17.25
Northern No. 2 foundry	16.45 to 16.70
Northern No. 3 foundry	15.95 to 16.20
Northern 8 per cent silicon	19.70

Finished Material.—There have been some fair specifications on contracts, especially on bolts, but railroads continue slow to purchase and the jobbing trade from the stores is quiet.

Coke.—There is but little change in the situation and the market rules quiet. There is little opportunity to judge of the market on contracts, as foundries are either covered or buy from hand to mouth. Prompt shipment prices continue decidedly lower than producers are willing to accept on forward deliveries. The following quotations represent the prices in the leading coke producing districts, the inside figures indicating what may be done on prompt shipment and the outside figures are asking prices on contracts.

	PER TON.
Wise county furnace coke	$1.75 to 1.90
Wise county foundry coke	2.10 to 2.30
Pocahontas furnace coke	1.75 to 2.00
Pocahontas foundry coke	2.00 to 2.25
Standard Connellsvills furnace coke	1.50 to 2.00
Standard Connellsville foundry coke	1.90 to 2.50

Old Material.—The market continues dull and easy with hardly enough trading to establish prices. Dealers' prices here are as follows:

Old No. 1 R. R. wrought, net tons	$14.50 to 15.00
No. 1 machinery, net tons	13.00 to 13.50
Old iron rails, gross tons	17.00 to 18.00
Old steel rails (re-rolling) gross tons	15.00 to 15.50
Old short lengths, gross tons	15.00 to 15.50
Old iron axles, net tons	17.00 to 18.00
Heavy melting scrap, gross tons	14.00 to 14.50
Stove plate, net tons	10.00 to 10.50
Heavy turnings	8.00 to 9.00
Cast borings, net tons	5.00 to 6.00
Car wheels, gross tons	14.50 to 15.00

The old board of directors of the Warwick Iron & Steel Co. was re-elected at the recent annual meeting in Philadelphia.

NEW YORK.

Exaggerated Reports of Price Cutting Curtail Buying.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Feb. 16.

Pig Iron.—There is possibly a little more activity than a week ago, but the improvement in this district is not important and current business is still confined to very small lots, chiefly for early shipment. One inquiry for a round tonnage of foundry iron is being figured on with a New England consumer, where the melt seems to be making slight though steady improvement. On small lots being placed in this district, there seems to be little shading of prices, and there is reason to believe that reports of concessions have been considerably exaggerated. One recent sale of 1,250 to 2,500 tons of foundry at full prices has come to light. There is still some negotiating for steel-making iron, two eastern steel interests in particular being anxious to place fair tonnages in case they can shade the asking price of $17 to $16.50, delivered. There has been some slight selling of malleable, a local melter taking on a small tonnage at a price reported to be as low as $17.25, delivered, and a few sales are reported from New England. Otherwise the situation is without feature. The monthly meeting of the Eastern Association is to be held in Philadelphia Wednesday. We quote delivery at New York tidewater over the remainder of the first half, as follows:

Northern foundry No. 1	$17.25 to 17.75
No. 2X foundry	16.75 to 17.25
No. 2 plain	16.25 to 16.75
No. 2 southern foundry	17.25 to 17.75
Malleable	17.50 to 18.00
Basic	17.00 to 17.25
Gray forge	16.25 to 16.75

Ferro-Alloys.—Two of the largest consumers in the eastern Pennsylvania district have closed for 1,000 tons each of ferro-manganese for delivery over the last half at slight concessions from prices which have prevailed, and another steel concern in the same territory recently took on 500 tons at a slightly higher figure, this transaction not having been reported heretofore. The current price level seems to be from $42.50 to $43.50, seaboard, small lots being had only at the higher figure. The ferro-silicon situation continues without change, and we quote $62 to $63, Pittsburg.

Finished Materials.—The situation is in a more unsettled state as a result of the widespread and persistent circulation of rumors that a general reduction in prices is imminent on all finished products except rails, tubular products and wire goods. These rumors apparently lack any particular basis at this time, as there have been no recent developments to give them substantiation—in fact the testimony of several interests is that some improvement is being made right along—but the trade seems to have taken firm hold of the idea that a cut is in prospect and is curtailing its already limited purchases accordingly. Improvement will be resumed either when a reduction is formally announced, or the trade is given to understand in a convincing manner that no reductions are to be made. No secret is made of the fact that on practically all lines outside of rails and tubes there is quite general and radical shading of official prices, though not by the Corporation and a few of the leading independents.

Three local structural contracts have been placed during the week with the Hay Foundry & Iron Works, the Corn loft building uptown, about 3,500 tons, an office building and store for the Title Guarantee & Trust Co. on 149th street and an 800-ton garage at Broadway and Fifty-seventh street; in all, these contracts run close to 5,000 tons. Plans have come out for the Onondaga hotel at Syracuse, a 2,500 ton proposition; bids are being considered on the Jordon-Marsh building at Boston, about 4,000 tons; the warehouse for the Boston Wharf & Terminal Railroad Co., involving about 3,000 tons of steel, is still under consideration, but no award has been announced; the Suffolk county court house at Boston is in the same situation; and the Apollo theater in this city, 1,500 tons, has not yet been closed. It will probably be two or three months before the Gimbel store building in this city will reach the steel stage, but it is one of the projects which are almost certain to go through and will call for about 12,000 tons of steel. Elizabeth, N. J., will receive bids until March 9 on a 600-ton postoffice.

Railroad work is light. The Central of New Jersey is taking bids on additions to its Point of Rock bridge, calling for 250 tons of steel. The Long Island system will receive bids up to the end of the week on 4,000 tons of standard sections, all 100-pound with the exception of 400 tons of eighties. We quote:

Angles, 2 to 6 inches x ¼-inch and heavier, 1.76c; beams, 3 to 15 inches, 1.76c; tees, 3 x ¼-inch and heavier, 1.81c; plates, carloads, tanks, 1.76c; marine boilers, 2.16c; bar iron, 1.45c to 1.50c; soft steel bars, 1.56c; sheets, No. 28, black, 2.66c.

Cast Iron Pipe.—The demand continues to improve, particularly in New England, but prices show little change and are still extremely low. The Boston letting, involving close to 2,700 tons ranging from 3 to 30-inch, went to R. D. Wood & Co., at from $23 to $23.60 delivered. The United States Cast Iron

Pipe & Foundry Co. secured the Woburn, Mass., order of about 500 tons and the Waltham, Mass., order of 150 tons. Hartford, Conn., has purchased 700 tons of various sizes from the Warren Foundry & Machine Co., Lynn, Mass., has a 500-ton letting today, and Chelsea a 400-ton letting later in the week. There are numerous small inquiries in the market, and a limited call for export is noted.

Old Material.—Further reductions in the price level have developed during the week, heavy melting steel, railroad wrought, track scrap and wrought turnings all being lower. Certain of the mills to which this territory is a seller are reported to be offering only $14, delivered, for steel, at which figure, of course, they are not securing any tonnage. The situation is weak, however, and transactions are at a minimum. Quotations on New York delivery, gross tons, follow:

Old steel rails (re-rolling)	$13.50 to 14.50
Relaying rails	21.50 to 22.00
Old car wheels	14.00 to 14.50
Old iron car axles	17.50 to 18.00
Old steel car axles	17.00 to 17.50
Heavy melting steel	12.50 to 13.00
No. 1 railroad wrought	15.00 to 15.50
Iron track scrap	13.00 to 14.00
Wrought pipe	12.00 to 12.50
Cast borings	8.00 to 8.50
Wrought turnings	8.50 to 9.00
Heavy cast scrap	13.50 to 14.00
Railroad malleable	12.50 to 13.00
Stove plate	10.00 to 10.50
Grate bars	10.50 to 11.00

PHILADELPHIA.

Light Business Does Not Test Pig Iron Prices.

Feb. 16.

Pig Iron.—The inactivity in this district is even more complete than a week ago, but the situation otherwise manifests little change. Current business is too light to try out prevailing quotations fairly, but so far as can be learned the few orders being placed from day to day are at full prices. There are reports of shading on early delivery metal by a few small interests, but this factor is not increasing. Sellers of furnace coke report a steadily growing volume of requests for delayed shipments, this being explained by the fact that the current iron output is considerably less than was anticipated for this season at the time the coke was contracted for. This reflects the disposition not to blow in additional capacity until there is no doubt of its need, as is the case of the Empire company with its Topton furnace. Reports that pipe makers have purchased considerable tonnages cannot be verified. We quote, delivery at Eastern Pennsylvania plants over the remainder of the first half as follows:

No. 1X foundry	$17.50 to 18.00
No. 2X foundry	17.00 to 17.50
No. 2 plain	16.50 to 17.00
Standard gray forge	16.00 to 16.50
Basic	16.50 to 17.00
Low phosphorus	21.50 to 21.75
No. 2 Birmingham	17.75 to 18.25
No. 2X Virginia	17.50 to 18.00
No. 2 plain Virginia	17.00 to 17.50

Finished Materials.—The outlook for railroad business seems a little more favorable. Early delivery is specified on the Baltimore & Ohio rail order, and it is anticipated that, in view of the light tonnage taken by this system in 1908, considerable further buying may be expected before the year is out. The Cambria and Bethlehem allotments under this order were small, aggregating only about 9,000 tons. Some very large car orders are pending and negotiations are practically closed on a good tonnage of rails for export. Frog and switch business shows a steady increase, and some attractive spike orders have been placed, the Jones & Laughlin company securing one lot of 100 tons for Panama.

In structural work, the Curtis building, involving about 7,000 tons, is expected out during the week. The 1,000-ton tobacco warehouse at Baltimore is to be bid on again, strictly as a steel proposition. The Union League steel contract has not been placed at this writing. The Phoenix Iron Works has been very busy of late getting out the steel for the suspended portion of the Manhattan Bridge, shipments of which are now being made to a storage yard near New York City.

We quote: Structurals, 1.75c to 1.90c; plates, 1.75c to 1.80c; refined bar iron, 1.50c to 1.55c; steel bars, 1.55c.

Old Material.—There have been a few sales of heavy melting steel at $15.75 and $16.00, delivered, and it appears that the decline has been checked, at least temporarily, as most of the accumulations in weak hands have now been disposed of. For the most part, however, mills are either out of the market entirely or are offring prices considerably below the ideas entertained by dealers, hence little business is being done. The embargoes at Harrisburg and Birdsboro have been lifted. We quote, gross tons, Eastern Pennsylvania plant delivery, as follows:

Old steel rails (re-rolling)	$17.00 to 17.50
No. 1 steel scrap	15.50 to 16.00
Old steel axles	20.00 to 21.00
Old iron axles	22.50 to 23.00
Old iron rails	19.50 to 20.00
Old car wheels	15.50 to 16.60
Choice scrap R. R. No. 1 wrought	17.00 to 17.50
No. 1 yard scrap	15.50 to 16.00
Machinery scrap	15.50 to 16.00
Low phosphorus scrap	19.00 to 20.00
Wrought iron pipe	14.50 to 15.00
No. 1 forge fire scrap	14.00 to 14.50
No. 2 forge fire scrap, ordinary	10.00 to 10.50
Wrought turnings	12.50 to 13.00
Axle turnings, heavy	14.00 to 14.50
Cast borings	11.00 to 11.50
Stove plates	12.50 to 13.00

BUFFALO.

Some Sales of Foundry Pig Iron Made at Low Prices.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Feb. 16.

Pig Iron.—So far as the tone of the market is concerned, little change has taken place in the past week, as the slight depression felt by producers and foundries continues. General quotations have not changed, but there have been sales made within a week of the foundry grades at prices, in some cases, nearly $1 less than highest prices named below. As these sales are for some foundry grades and mostly for small tonnage, it has not altered the general schedule of prices. Furnacemen say the outlook is satisfactory, although the present quietness is a disappointment and causes a trifle more concern than the shifting conditions which marked the close of 1908.

Foundries have not the work in hand that they expected, with certain exceptions. Several large foundries in the Buffalo district are running full time, but many have little business at present. The general average is given here at about 65 per cent of normal. The following prices, f. o. b. Buffalo, generally prevail:

No. 1X foundry	$16.75 to 17.25
No. 2X foundry	16.25 to 16.75
No. 2, plain	15.75 to 16.25
No. 3	15.50 to 15.75
Malleable Bessemer	17.00 to 17.50
Gray forge	15.25 to 15.50
Charcoal	20.50 to 21.00

Finished Products.—No closing of interest is reported for the past week and business is generally quiet in this line, with the exception of figuring on specifications for several large contracts in sight. It was reported authoritatively here today that the Sinclair Rooney Co., of Buffalo, has decided to erect a seven-story building of brick and steel at the corner of Washington and Mohawk streets, costing about $125,000.

ST. LOUIS.

Pig Iron Dull—Resale Transactions Made With Concessions.

Feb. 15.

Pig Iron.—Dullness continues to rule the pig iron market in the St. Louis territory. While inquiries are somewhat better this week, actual business is very light. One malleable concern is in the market for a round tonnage for shipment over the remainder of the first half of the

year, and one inquiry is out for southern iron, but the aggregate tonnage is not large. The inquiry for malleable probably will be closed this week.

Ohio iron is quoted at $15.25 to $15.75 f. o. b. the furnaces, for shipment of the remainder of the first half of the year. A few scattering orders are being taken for Ohio iron on this basis, ranging from car lots to 150 tons. One order for 250 tons of southern iron was booked at $12.75, Birmingham, for No. 2. The furnaces continue to maintain a price of $13 for No. 2, but some re-sale iron is offered at 25 cents less. Our quotations delivered, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$17.00 to 17.50
No. 2 southern	16.50 to 17.00
No. 3 southern	16.00 to 16.50
No. 4 southern	15.50 to 16.00

Coke.—The best selected 72-hour Connellsville foundry coke is selling at $2.15 to $2.75 for all deliveries. Three hundred tons of Connellsville foundry was sold last week for shipment to July 1, inclusive. Shipments are coming in satisfactorily and contract customers are taking their full quota. Connellsville 48-hour furnace coke is offered at $1.50 to $1.75, ovens. Virginia and West Virginia 72-hour foundry is held at $2.25 to $2.75, ovens, for all shipments, and Virginia furnace at $1.75 to $1.90. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Old Material.—The market for scrap iron remains unchanged at the following figures:

Cast iron borings, free from foreign material, net tons	$ 6.00
Steel axle turnings, gross tons	12.00
Steel railroad axles, net tons	17.50 to 18.50
Iron railroad axles, net tons	19.00 to 20.00
Miscellaneous steel scrap, gross tons	12.50 to 13.00
Old car wheels, gross tons	16.00
No. 1 railroad cast scrap, net tons	12.00 to 12.50
Heavy machinery cast, net tons	13.00 to 14.00
Stove plate and light cast, net tons	11.50
Sheet iron, net tons, uncut	5.00
No. 1 railroad wrought, net tons	13.00 to 13.50
Railroad malleable, net tons	12.00 to 12.50
Heavy melting steel, net tons	13.00 to 13.50
Relaying rails, net tons	17.00 to 18.00

SEATTLE.

Heavy Specifications on Tin Plate—Five Ships Bringing Pig Iron.

Office of THE IRON TRADE REVIEW,
302 Pioneer Bldg., Feb. 13.

A strong movement in tin plate, a somewhat relieved situation in spot pig iron and very mixed conditions in iron and steel bars characterize the Pacific coast iron market at present. General conditions are sound; collections are unusually good and most buyers are discounting their bills. Actual business, however, in iron and steel products shows but little advance over the conditions during the latter part of January. The improvement in business, while measurable, is slow. The most encouraging factors are a revival of activity in building lines, a fair demand for lumber machinery and steadily improving foundry conditions. Building permits for the coast cities during January were above expectations and Seattle set a new high record, issuing permits to the aggregate value of $2,072,465. Of this amount $1,200,000 was for business buildings. Specifications on tin plate for salmon cans have been encouragingly heavy and will be at least 10 per cent above 1908, the tonnage for this season to date amounting to over 11,500 tons. If the first run of fish is up to expectations, there will be more specifying later in the spring. Foundry conditions are still improving, but the advance is nothing spectacular. The Independent Foundry Co., Portland, has taken an order for the columns for the Swift Packing Co. building at Portland. It is reported that the Griffin Wheel Co. has received orders for 4,800 freight car wheels to be cast at the South Tacoma plant. The orders are from the Northern Pacific railway. The Larson Lumber Co., Bellingham, Wash., has ordered a 500-horsepower engine from the Minneapolis Steel & Machinery Co., together with other machinery; other scattering orders from lumber interests are reported. Another indication of essential soundness is found in the successful floating of the Colby Combined Harvester & Thresher Co., to manufacture harvesting machinery at Walla Walla, Wash.

Pig Iron.—Spot iron is still scarce and high, but most foundries have been provided, so there is no danger of a shut down. Five ships with about 6,000 tons of European iron are now on the way to Puget Sound. These ships and their expected dates of arrival are as follows: Procyon, overdue; Zinita, May; Celticburn, June; Skjold and Ben Lee, August. The ships Matterhorn and Suconf each with about 1,100 tons of pig are due on the Columbia river in July. The arrival of the Procyon will relieve the tension in spot iron; the other ships are well distributed and with good weather should arrive at convenient intervals. The cargoes of the May-June ships are well sold out; iron on the July-August ships is being bought sparingly. We have revised our prices and quote as follows, in gross tons ex-ship on Puget Sound:

English, Cleveland No. 3 spot	$25.50 to 26.00
Glengarnock, No. 1 spot	28.00 to 29.00
English soft No. 1 to arrive May-June	24.00 to 25.00
English soft No. 1, to arrive July-August	23.00 to 24.00
Southern soft, No. 2	26.70 to 27.20

Old Material.—The market has undergone little change in the last two weeks. Foundries are buying good scrap in satisfactory volume. Wrought iron is still dull. We quote in net tons, f. o. b. Seattle:

Foundry and machinery scrap	$17.50 to 19.00
Old steel rails	8.00 to 9.50
Railroad wrought	10.00 to 11.00
Country wrought and busheling	5.50 to 8.00

Merchant Iron.—Mill interests have advanced their prices to jobbers on common iron to $2.10, but there has been no change in the resale price. The movement of bar products is still spasmodic, and will continue so until the price situation clears. A shipment of about 1,000 tons of European bars at a price said to be $1.70 per hundred pounds in Seattle is an additional disturbing factor. Current quotations are being shaded and the situation is weak. We quote base prices per 100 pounds, f. o. b. Seattle, common iron bars, $2.20; mild steel bars, $2.30; machinery steel, $2.75; Norway iron, $3.50; angles, channels, zees and tees, under 3 inches, $2.75.

BIRMINGHAM, ALA.

South is Passing Through a Dull Period With Hope.

Feb. 15.

Manufacturers of pig iron in the southern territory are more hopeful that there is going to be an improvement in the general conditions in the near future. There is a more cheerful feeling prevalent here. The home consumption has been holding up well and the shipments from the district have been steady. The little business that has been coming in of late more than makes up for the business that was ordered held up by consumers who placed their orders before the new year started in.

Quotations have been holding up well under the trying times. A prominent iron and steel man when asked anent the conditions in this section said: "The southern iron market is now getting a taste of what other sections experienced during the past year. The south did remarkably well all through 1908 and now we are beginning to see what happened in other sections of the countries. I look for an early improvement, though, in conditions and believe there will be need for not only a steady production of iron but a larger output."

No. 2 foundry continues to sell at

$13 per ton, No. 2 foundry, though reports are still to be heard to the effect that there has been some of the product let out at a cheaper price.

There has been no cessation of operations at the plants of the Birmingham Coal & Iron Co., which concern went into the hands of receivers this month.

BRITISH IRON MARKET.

American Conditions Reflected—Considerable Disappointment Felt.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 6.

The British iron market fairly reflects the condition of affairs prevailing in America inasmuch as a good deal of disappointment prevails through the failure to realize the somewhat rose-colored anticipations of the new year. The Middlesbrough market has shown this rather more decidedly than other districts during the last week, buyers holding off orders and generally making a determined effort to bear the market. The fact that they have only depressed prices by twopence to threepence per ton suggests that there is a good deal of innate strength in the market. But stocks continue to grow, being now about 160,000. There has been an increase during January of 20,093 tons. The additions during the month have not been quite so large as during December, but the shipments were decidedly poor, totaling 75,434 tons, which while a shade better than December, was with that exception the poorest month since February, 1905. In the Birmingham and Midland district, there is no sign of weakness in the pig iron situation, although Northampton smelters are a little more anxious for business. Practically all the furnaces in Northamptonshire, Derbyshire and Staffordshire are well off for orders for the first quarter of the year, and in some cases up to June. In a few cases they have obtained better prices for pig iron. The Middlesbrough quotations are for warrants 48s 2½d ($11.81), and for No. 3 Cleveland pig iron 48s 6d ($11.88). In the hematite department business is very quiet, mixed numbers selling at 56s 6d ($13.82). The furnaces have benefited a little by the cessation of the bedstead strike, which has resulted in some orders for small castings for bedstead purposes.

Finished Material.—The finished iron and steel trades leave a good deal to be desired in the matter of weight of orders. But there is a great amount of business being done for small orders for immediate requirements, and country districts are buying better for merchants' warehouses. The galvanized sheet trade is fairly furnished with orders, but a good deal is being heard of American competition, especially in the South American markets. Very little Continental iron and steel is coming into this country. There are rather better reports from the northern districts, but such great establishments as the Barrow steel works are still idle and likely to continue so for some time to come.

METAL MARKET

NEW YORK.

Feb. 16.

Copper.—The market has drifted along in an uncertain manner, with business so limited that no features have developed. The statement of the Copper Producers' Association, issued a week ago, was somewhat more favorable than anticipated, although it showed a gain in stocks during January of about 22,000,000 pounds on a domestic production of 112,000,000 pounds during the 12 months. Stocks in the United States Feb. 1 were placed at 144,130,045 pounds. The current level of prices is: Lake, 13½c to 13⅝c; electrolytic, 13c to 13⅜c; casting, 12⅞c to 13⅛c.

Pig Tin.—A slight improvement in buying has resulted from the lower prices, and the metal has firmed up, current business going at from 28¼c to 28½c, New York.

Pig Lead.—Brisk competition for business in a dull market has sent prices lower again, the ruling figure now being 3.97½c to 4.02½c, New York.

Spelter.—A continuance of light demand, coupled with considerable pressure to sell, has featured the market. We quote: 4.85c to 4.90c, New York.

Antimony.—Cookson's, 8c to 8⅛c; Hallett's, 8⅛c to 8¼c; ordinary brands, 7½c to 7¾c.

CHICAGO.

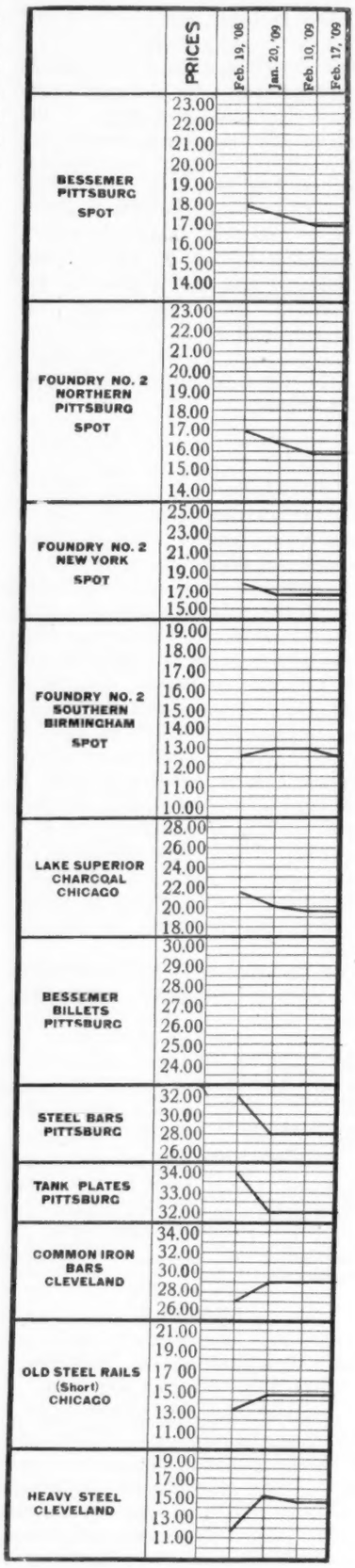
Feb. 16.

The metal market is quiet. Copper transactions have been few. Tin is stronger with an upward tendency but lead and spelter are moving at lower prices. We quote as follows:

Lake copper, carload lots, 14¼c to 14½c; castings, carload lots, 13¾c; pig tin 30c; spelter 5c to 5.10c; pig lead desilverized 4.10c to 4.20c in 50-ton lots; corroding 4.65c to 4.70c in 50-ton lots; car lots 2½c per 100 pounds higher; sheet zinc 7c list f. o. b. LaSalle in car lots of 600-pound flasks; Cookson's antimony 10½c to 11c; other grades 10c.

There has been practically no

PRICE CHART.



change in the scrap metal situation and we quote buying prices as follows:

Copper wire, 12¼c; heavy copper, 12c; light copper, 11c; heavy red brass, 11⅛c; heavy yellow brass, 8¼c; light brass, 6¼c; No. 1 red brass borings, 8¾c; No. 1 yellow brass borings, 7¾c; brass clippings, 8¼c; tea lead, 3c; lead scrap, 3.40c; zinc, 3.25c; tin pipe, 23½c; tin foil, 21.50c; pewter, 16½c; electrotype plates, free from wood, 3.90c; electrotype dross, 2¾c; stereotype plates, 4¼c; stereotype dross, 2.90c; prime slab zinc dross, $50 per ton.

ST. LOUIS.

Feb. 16.

Lead and Zinc.—The price for zinc ore in the Joplin district last week ranged from $38 down to $35 a ton. An atmosphere of dullness pervaded the district, and it is not believed that there will be much activity until after the special session of congress in March, as quite a number of large mining deals are dependent upon what action congress takes.

Lead ore also showed a falling off, the highest price reported being $50 a ton. Silicate of zinc brought $19 for 40 per cent ore. The pig lead and spelter markets of New York and St. Louis also registered a decline. St. Louis spelter was quoted at $4.82½ at the end of the week, and pig lead at $3.95; New York spelter at $4.90, and pig lead at $4.02½.

Dominion Coal Decision.—The judicial committee of the British privy council has given judgment in the case of the Dominion Iron & Steel Co. against the Dominion Coal Co. in the action for damages for breach of contract, sustaining the decision of Judge Longley of Nova Scotia in favor of the Steel company. The judgment orders that the case be remitted to the supreme court of Nova Scotia to have the damages assessed, because of the repudiation of the contract on Oct. 31, 1906, and also because of violation previously committed.

In connection with a portrait of Congressman W. Aubrey Thomas, published in the issue of Jan. 28, an incorrect statement was inadvertantly made that he was president of the Niles Iron & Steel Co., now the Thomas Steel Co., of Niles, O. The president is W. A. Thomas, as was published in the semi-historial sketch continued in the issue of Feb. 4, and as published at various other times recently in THE IRON TRADE REVIEW.

MR. SWANK HONORED

By Temple University, Philadelphia—President Conwell's Address.

The exercises connected with the founders' day celebration of Temple University, Philadelphia, Saturday afternoon, Feb. 13, were of the character of a Lincoln memorial ceremony, and former Governor Edward C. Stokes, of New Jersey, was the principal orator, his subject being "Abraham Lincoln."

Of special interest to the iron world in which he is so favorably known, was the conferring of the degree of LL. D. upon James Moore Swank, general manager and secretary of the American Iron and Steel Association. In conferring the degree, Dr. Russell H. Conwell, president of Temple University, made an appropriate address, speaking of the great services rendered to the iron business and to history by Mr. Swank. A number of prominent iron and steel manufacturers, who are friends of Mr. Swank, including John Fritz, were present. In addressing Mr. Swank, President Conwell said:

There is a special fitness in this action, because you are receiving, my friend and brother, these recognitions of your great life work from an institution which represents the cause you have advocated all your life. Before you began to write and to speak, before you began to serve the great corporations and the industrial interests of the state and country, the universities of the land were largely devoted, exclusively devoted, I might say, to literary topics. They were not interested, especially, in the life of the man at the loom or the forge or the man in the shop. They did not intend to teach men to be more skillful with their fingers. They did not purpose to teach that the man in his industrial occupation should learn more where he was and consequently be more useful where he was. They were looking to the idea of intellectual achievement along the line of literature; consequently, the great masses of the people were untouched by university work in all portions of the world. But since men like you, and you as a leader of them, have been at work, especially in the history of industrial work, you have given a dignity to industry, you have given it a place in the libraries of the land, you have called the attention of the world to the fact that the man can work at the forge and still be a man—that he can work at any of the industrial occupations of this land and still be worthy of the highest respect and the highest honor. You have been teaching that no matter how humble a man's station is, if he will do his full duty in that place, he is just as much entitled to the American people's honor as is a king upon his throne. And because you have taught these things, because your life has been such an inspiring example of it, because of the fact that this university is composed of those very ideals, we are your brothers, and I, on behalf of the university, present to you today this diploma, indicating the fact that we desire to confer upon you this degree—not for your sake, because you and I have but a few years left here in which to enjoy either honors or riches, but for the sake of setting before the world the example of an institution recognizing the honest work of a man who puts his life and soul into any worthy occupation.

I therefore confer upon you this degree and the additional badge, the outward symbol of the rank which you will bear among the educated men of the land.

EMPLOYERS' ASSOCIATION OF BUFFALO.

The Employers' Association of Buffalo, with offices at 691 Ellicott Square, met in annual session Feb. 2, and elected the following officers and directors:

R. W. Gardner, president, Howard Iron Works; J. M. Edsall, first vice president, E. R. Thomas Motor Co.; Alfred J. Russell, second vice president, Russell & Watson; George M. Trefts, treasurer, Farrar & Trefts; John E. Gorss, secretary; Howard D. Barker, Frank Machinery Co.; Henry G. Breed Jr., Gies & Co.; William H. Crosby, The Crosby Co.; Henry R. Ford, McCarthy Bros. & Ford; C. M. Greiner, Buffalo Pitts Co.; Lyman P. Hubbell, Fillmore Avenue Foundry & Iron Works, Inc.; Edward Kener Jr., Buffalo Co-Operative Stove Co.; Henry May, Pierce-Arrow Motor Car Co.; T. L. Richmond, Buffalo Scale Co.; C. W. Sherman, Pratt & Letchworth Co.; C. D. Taylor, Buffalo Storage & Carting Co.

This meeting marked the close of the first year's life of a new organization, one which was born of a combination of the foundry and metal trades associations in Buffalo. It has been very successful and this was indicated in no undecided words in the various reports of officers made at the annual meeting. The association welcomes into membership all concerns employing labor, and the membership list is growing healthfully. Through the medium of the Buffalo Employers' Association the relations between the employer and employed have substantially improved and the good work so far accomplished is to be continued under the high grade personnel of the directorate named herewith. Plans for the first annual association dinner are under way, but the date for this event has not been fixed.

Saxton, Pa., stack of Joseph E. Thropp was blown in Jan. 21.

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February 18, 1909.

THE DISTRIBUTION OF NEW FURNACES.

The expectation that another merchant furnace will be built at Midland, Pa., draws attention anew to the drift of blast furnace location. The problem of the merchant blast furnace is materially different in several respects from that of the steel works. There is more occasion for the merchant blast furnace to consider probable markets than is the case with the steel works. The latter must make quite a variety of products, and must ship them over a wide range of territory. It cannot find a particular district for which it can be said there is an insufficient supply. The tendency of the steel works is to find the geographical center of the country in steel consumption. The merchant blast furnace, on the other hand, may well locate in the center of a consuming district having a comparatively small radius, provided that convenience in assembling raw materials is afforded at the same time.

In the present era of new blast furnace construction, the building of steel works furnaces has been, with the exception of the great Gary plant, chiefly in connection with steel works already well established. It is true that the steel works most advantageously located are the ones most likely to expand in the direction of new blast furnaces, so that to an extent the geographical distribution of steel works blast furnaces illustrates economic laws, but in general the location of merchant furnaces, being subject to freer choice, shows the more definite trend.

In the past four calendar years, 16 absolutely new merchant blast furnaces have been completed and blown in. One of these, being a furnace for the smelting of zinc residuum, and therefore located by other considerations, may be eliminated, leaving 15. Of these there were three practically in the Lake Superior ore region, one being a coke stack in Wisconsin and two being charcoal stacks in Michigan. Two were in Alabama. The remaining 10 were in the central west, one being at South Chicago, on Lake Michigan, four on Lake Erie, at Toledo, Erie and Buffalo, three in southern Ohio, and two in western Pennsylvania, at Midland and Josephine. Thus there were three in the Lake Superior ore region, two in the Birmingham region, and 10 well distributed in the central west with as much reference to channels of consumption as to assemblage of raw materials.

Including the new Midland furnace there are six absolutely new merchant furnaces in prospect: One at South Chicago, two at Cleveland, two at Buffalo, and one in western Pennsylvania near Pittsburg, five out of the six, therefore, being on the great lakes. Considering these in connection with the 10 central western furnaces blown in during the past four years, there are two on Lake Michigan, eight on Lake Erie, three in southern Ohio and three in western Pennsylvania.

The location on Lake Erie has been determined chiefly by the advantage of ore, the inland freight on ore, covering practically two tons of ore to one ton of pig iron, being a heavy item. That, however, was not the only item, as the cheapness of water transportation on pig iron is inviting, affording the furnace an opportunity to make cheap shipments on occasion to quite distant points. It is to be noted that the furnaces located inland have in practically every case depended on coke made on the ground. There is no longer such a thing as definitely locating a merchant furnace half way between the coke and the ore. Many furnaces were so located, but improvements in practice on the one hand and enhancement in the value of Connellsville coking coal lands on the other have made it undesirable to depend upon coke shipped from a distance unless there are other and very important advantages in the location.

It is a curious fact that Allegheny county, which in each of the three years prior to 1908 produced more than 5,000,000 tons of pig iron, almost one-fourth of the country's total, has but one merchant blast furnace. Allegheny county is a very heavy consumer of merchant pig iron, and particularly of foundry iron. It may, indeed, be on this account that it is short of merchant furnaces. Manufacturing activities are too intense for a blast furnace requiring room for present and prospective operations, and difficult to move, while it makes a product which can be shipped easily. The tendency rather has been to locate just outside Pittsburg, and there are now five merchant furnaces outside Pittsburg, but with a freight to Pittsburg less than that of the Mahoning and Shenango valleys.

The time was when more foundry iron was produced in Allegheny county than has been the case of late. The three Isabella and two Carrie furnaces, until their absorption by steel making interests, made a great deal of foundry iron, and the two Lucy furnaces, although the first furnaces built by the Carnegie interest, used to make foundry iron on occasion.

AN IMPORTANT PROTECTIVE FEATURE.

Chairman Payne, of the house ways and means committee, stated some time ago that there was one thing—and he intimated also that there was

but one—that could be counted upon as definitely settled with respect to the new tariff, and that was that it would have maximum and minimum rates. The nomenclature should be changed to the more graceful one of the French, who have "ordinary" and minimum rates. In the comment on tariff matters, little has been said of this feature, but it is one of extreme importance. The arrangement of a sliding scale in tariff duties constitutes protection of an important kind, protection against the tariffs of other countries, and it must not be forgotten that one cannot always take and never give, so that there may, conversely, be an argument for keeping the bars as low as is consistent with full protection.

The French Parliamentary Customs Commission has recommended some important advances in the French tariff, which are to be submitted to the chamber of deputies toward the end of this month. Commenting at length on the proposition to advance the rates, the *Iron and Coal Trades Review* of London says:

The tariff, of course, will apply to other countries as well as our own, but their fiscal systems will doubtless enable them to retaliate if they think it necessary, whereas in this country, of course, the case is different, and British tariff reformers as asking whether, in view of the fact that French goods to the value of over £50,000,000, taking the average of the last seven years, are imported into this country annually, France would dream of imperilling that trade were we not committed to a policy of free imports.

These words speak for themselves. It would not be well for us to place ourselves in the position which our British contemporary is disposed at this juncture to lament its country is in.

Another phase of the subject is presented by Consul-General Frank H. Mason, of Paris, who reports that a number of manufacturers are making in France steam pumps of American models. He says they do this because all machinery imported into France from the United States is subject to the maximum rates of duty, whereas similar machinery coming from Great Britain, Belgium or Switzerland would be entered at the minimum schedule of duties, which is from 40 to 60 per cent lower than the maximum. This is because these countries have reciprocal trade relations with France, and consequently, when there is a market in France for imported pumping machinery, other countries have an important advantage over the American exporter. It would seem to be entirely proper to charge the highest tariff rates to those countries which discriminate against the United States.

COSTS OF PRODUCTION IN THE UNITED STATES AND GREAT BRITAIN.

(*The Engineer*, London.)

Mr. Carnegie's declaration that the cheapest steel in the world is produced in the United States, coupled with the tariff revision controversy, raises anew the general question of American competition with Great Britain, and offers material for interesting speculation. If this assertion is true, how comes it that United States iron and steel makers, with mills standing idle for want of orders, have permitted their British and German competitors to export between 7,000,000 and 8,000,000 tons of iron and steel these last twelve months? * * * * Capital liabilities and cost of repairs and renewals are, roughly, three times as high per ton of output in the United States as in Great Britain. These exorbitant capital charges, coupled with insurmountable geographical handicaps, render it practically impossible for the Americans to produce iron and steel so cheaply as it can be produced in this country, Mr. Carnegie's assertions notwithstanding. Here we have cheap, abundant, and highly convenient supplies of raw materials; we have coal, ore, limestone, blast furnaces, and shipping ports practically side by side; and on top of these great natural and geographical favours we have sound capitalization—a combination of advantages not to be found in America.

Oglebay-Norton Ores.—Oglebay, Norton & Co. have issued their annual booklet giving analyses of iron ores which they are offering for sale for the season of 1909. The ores sold by this firm are as follows: Belmont, Berkshire, Bristol, Castile, Chatham, Clifford, Empire, Eureka, Glyuna, Hadley, Lawrence, Manganate No. 2, Montreal, Moose Mountain, Ottawa, Ottawa Manganese and Yale.

NEW SHEET AND TIN PLATE PLANT.

The Deforest Sheet Steel Co., of Niles, O., on Monday of this week announced its plans for the erection of a new sheet and tin plate plant at Niles. Work will be started at once upon the buildings, the main structure to be 1,180 by 70 feet with lean-tos 25 x 35 feet on either side.

The plant will consist of six sheet mills and six tin mills, with a total capacity of approximately 5,000 tons per month. The site is on the Heaton farm in the northern limits of Niles, and is on the Erie and B. & O. railroads, comprising a tract of 50 acres, which makes ample provision for a steel plant should the company at a later time decide to erect one.

All details of machinery have not been determined, but the promoters of the new plant have decided that all housings, etc., are to be of steel, and of the same dimensions usually given for gray iron housings, the steel giving much greater strength.

The T. & T. Metal Roofing Co. will be a subsidiary organization to the Deforest Sheet Steel Co., and will manufacture corrugated and galvanized sheets.

The officers of the new companies are: Wade A. Taylor and Chas. S. Thomas, formerly president and general manager, respectively, of the Empire Iron & Steel Co., of Niles. The capitalization is at present nominal and will be increased as it is needed.

Enlarging Tube Facilities.—The Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, has recently added another, the fifth, new annealing furnace 24 feet long, 6 feet wide, by 8 feet in height. The company is now drawing seamless steel tubes 4 inches in diameter, and says it expects to be equipped in a short time to produce cold drawn seamless steel tubes as large as 5 inches in diameter. The range of diameters will therefore be from a tube as small as a hypodermic needle on up to 5 inches in diameter. These works claim in addition to the low carbon steel tubes, to be the only makers of seamless tool steel tube, or crucible steel tube, in the world. The company reports a brisk trade, being eight weeks behind on orders. A specialty of extremely accurate tubing is made by this, claimed to be the oldest seamless steel tube mill in America.

LEND A HAND.

(Continued from first page.)

so far as our positions and opportunities may permit. If profiting by the past, following the example of the chief executive who is about to lay down the cares and responsibilities of public office, keeping in mind the ideals concerning civic life and the practice which he has unfalteringly proclaimed, we shall evidence our disposition to subordinate private interests to the public good, we need have no fear that vested rights in property or private and pecuniary interests in business will be disturbed or interfered with by the incoming administration.

Mr. Carnegie's Statement.

Andrew Carnegie declared emphatically in a statement given to the editor of *American Industries*, that congress is absolutely incapable of fixing or adjusting the tariff, and the only just method of making a fair or comprehensive schedule is through a permanent non-partisan commission of experts. Mr. Carnegie also believes that eventually there will have to be a great industrial tribunal, which shall have the power to absolutely fix prices of the necessaries of life. Mr. Carnegie said:

The industrial world is about to undergo the most momentous change known in its history, even more far-reaching than was the change from the individual domestic manufacturer, manufacturing at home, to the factory system and the huge establishments of today. We are rapidly losing competition in articles of general consumption upon which the nations have hitherto depended to insure reasonable prices for the consumer. Some of our most important industries today are only nominally competitive and in reality are monopolies so far that an understanding exists as to prices that will prevail. We cannot, it seems the opinion, withstand this movement. It has to be received and tested, which means that these virtual monopolies must be controlled some way or another. The only force appears to be that of the national government. A supreme industrial court will have to be created, and eventually, it will have to pass upon prices—disguise this as we may.

Marked Loss in Tonnage.—A marked loss, partly due to low water, in the tonnage moved on the Monongahela river from the port of Pittsburg during the year 1908, is shown by the records of the government engineers of that city. The total tonnage passing through the locks from Dec. 1, 1907, to Nov. 30, 1908, was 9,972,765, compared with 12,772,508 in 1907. In iron and steel products, 98,219 net tons were shipped, against 67,794 net tons the preceding year. The coal tonnage in 1908 was 8,563,909, compared with 10,743,317 in 1907.

REORGANIZATION OF THE SOUTHERN STEEL CO.

At a meeting, Feb. 11, of the Southern Steel Co. reorganization committee, the reorganization plan proposed some time ago was declared operative, following the announcement that the $2,000,000 fund required for this purpose had been raised. The various properties owned by the company will be sold by the trustees in bankruptcy, W. H. Hassinger, John C. Morris and T. S. Kyle, at Birmingham, Ala., some time in March, and the work of improvement and extensions already planned will then be begun.

The terms of reorganization call for the formation of a new company under New Jersey laws, in which will be vested properties now held by the Southern Steel Co., the Georgia Steel Co., the Lacey-Brck Iron Co. and the Chattanooga Coal & Iron Co. Directors of this company will be elected by classes by the reorganization committee. It is understood that new securities will be authorized as follows: $10,000,000 of 4 per cent first and refunding mortgage 20-year gold bonds; $10,000,000 common stock, and $7,000,000 non-cumulative 6 per cent preferred stock.

The Southern Steel Co. went into the hands of receivers Oct. 25, 1907. The reorganization committee, which has been at work for several months, has had its headquarters at 30 Pine street, New York city, with D. G. Boissevain, as secretary, in charge.

Will Meet in Chattanooga.—At the meeting of the executive committee of the Southern Supply and Machinery Dealers' Association held in New Orleans, Feb. 4 and 5, it was unanimously decided to hold the next convention in Chattanooga, with headquarters at the Hotel Patten, on May 5, 6 and 7. The committee expressed regret at being unable to accept the invitation of the National Supply and Machinery Dealers' Association to meet with it in Pittsburg, and invited it to have delegates present at the Chattanooga meeting. A resolution was adopted extending an invitation to the American Supply and Machinery Manufacturers' Association to meet in Chattanooga with the Southern Supply & Machinery Dealers' Association. W. E. Mills, of the James Supply Co., Chattanooga, Tenn.; H. C. Clark, of the Charlotte Supply Co., Birmingham, Ala., and Mr. John C. Doyle, of the Nashville Machine Co., Nashville, Tenn., were appointed an entertainment committee of three to confer with a similar committee from the American Supply and Machinery Manufacturers' Association to work out the details of the program.

CONSIDERABLE INQUIRY

Noted by Eastern Pennsylvania Operators—More Stacks to Blow In.

Harrisburg, Pa., Feb. 16.—Although few new orders have been received by the companies operating in this part of the state, it is said that there is considerable inquiry and that within a month additional furnaces will go into blast. The latest stacks to start include some of the Thomas Iron Co., in the eastern section; one in the Lebanon district and one in this city.

An interesting fact in connection with the operation of plants in this district is the dismantling of the Bessemer mill of the Pennsylvania Steel Co., at Steelton. This mill has not been operating for over a year and some of the machinery is being taken out, although it is understood that the company will maintain it in such a manner that it can be brought into service at comparatively short notice. It is said, however, that the company will depend exclusively on open-hearth steel for its rails, having successfully put into operation in the last eight months five 75-ton furnaces which are being run steadily.

The Gardner Axle works at Carlisle, which were damaged by fire, will be rebuilt at once.

The Middletown car works, which recently resumed operating, is engaged on a large order for cars for Cuban plantations.

Application has been made for a state charter for The Scott Iron & Steel Co., of Pittsburg. The men interested are John A. Scott, George P. Steel and Jay C. Stouffer, of Pittsburg. They ask a charter to manufacture forgings and rolled products.

The Reading Iron Co. has taken out a city permit to build in Reading a pipe mill, to be known as mill No. 6. It will be of steel and be 275 x 400 feet. The new mill will be of steel construction, and will manufacture large sizes.

The Chester Grey Iron Foundry Co. has arranged for the erection of a new building in Chester. This firm is a new one and will supply local trade for the present.

The American Iron & Steel Manufacturing Co., of Lebanon, has elected James Lord, president; John Penn Brock, vice president; H. M. M. Richards, treasurer, and D. G. Scott, treasurer.

BESSEMER ROAD

Shows Effect of Depression—Success of Steel Ties Assured.

The restricted operations of the Carnegie Steel Co. during 1908 is reflected in the annual report of General Manager E. H. Utley, of the Bessemer & Lake Erie Railroad Co., for the year ending Dec. 31, 1908. A controlling interest in this railroad being owned by the Carnegie Steel Co., the chief freight movement over this line is the transportation of ore from the Lake Erie docks to the blast furnace plants of the latter in the Pittsburg district. The total shipments of ore during 1908 showed a decline exceeding 1,000,000 tons over the preceding year. In commenting upon the effect of the business depression on the haulage of the road, Manager Utley says:

The business depression which the whole country began to feel in October, 1907, continued to affect the railroad interests during 1908. The Bessemer road was fortunate to a certain extent in having a call on the ore shipments for the Carnegie furnaces in the Pittsburg district. This movement, however, did not commence to any extent until the middle of June, so that for the first six months of 1908 a large percentage of the equipment was idle and necessarily the revenues correspondingly small.

Our entire ore movement for 1908 was 4,715,023 gross tons, compared with 5,843,186 gross tons in 1907, showing a falling off of 1,128,163 tons for the year.

The total number of cars of ore, coal and limestone transported by this company during 1907 was 223,023; in 1908 the total was 175,915, showing the number of carloads of these commodities 47,108 less in 1908 than in 1907.

The ore movement, which commenced about the middle of June, continued in volume until the close of navigation, the latter part of November. During the month of October we handled from docks to furnaces 815,000 tons of ore, which is the best record for any one month in the history of the road; 780,000 tons during August, 1907, having been the previous high record.

The road's experience in the use of steel ties is expressed by Manager Utley as follows:

The use of the steel tie continues to increase our confidence in its utility and I think it is within reasonable bounds to assert that within the next three years the Bessemer road will be double-tracked between Conneaut harbor and North Bessemer with steel ties, and that by that time the price of first-class white oak wooden ties will be considerably over $1 each, whereas the steel ties are selling today at about $2, and that the management of the Bessemer road can feel that, aside from the few ties that may be destroyed by reason of derailments (and which have a scrap value of at least half of their purchase price), for the next 20 to 40 years the question of tie renewals will not enter into the calculations of expenses for maintenance of way.

The total operating revenue of the line during 1908 was $5,240,951, compared with $6,376,952 in 1907, or a decrease of $1,136,000, and the net revenue $2,064,635, against $2,745,274 the previous year, or a decrease of $680,638. The total freight hauled, exclusive of the ore, was 4,077,141 net tons, compared with 4,790,992 net tons in 1907. The passenger, mail and express traffic amounted to $337,904. The railroad owns 114 locomotives and 23 additional are now being built to be delivered by April 1, 1909. The company has 9,836 cars, of which 8,102 are steel gondolas and hoppers. The total main trackage owned and operated by the company is 218.09 miles.

MAY BUILD SECOND STACK.

The Midland Steel Co., Pittsburg, is considering the advisability of erecting a second stack at its blast furnace plant at Midland, Pa. Preliminary steps upon the proposal have been taken but no formal action in the way of awarding contracts has been determined. In the event that the plan is to be carried out, work will probably be instituted in the spring. The building of a second furnace is looked upon as a logical development of the company's property. At present the company operates a modern merchant furnace on basic iron which supplies metal to Pittsburg and surrounding markets as the freight charge by reason of its nearer location is considerably less than the 90 cent rate from the Mahoning and Shenango valleys to Pittsburg. The second stack if erected would be run on foundry iron. The Midland Steel Co. possesses a large works site on the Ohio river a few miles below Beaver, Pa., where it operates its present furnace and a foundry. This is regarded as an admirable location in the Pittsburg territory for a large steel works and it is likely that an open-hearth plant may be erected there eventually.

Reports of a large steel company negotiating for the purchase of the ground and plants of the Midland Steel Co. are officially denied.

The Standard Steel Car Co. expects to resume operations at its car works at Butler, Pa., about March 1. Material is now being shipped to the works and preparations made for the resumption of activity. The company has recently booked a number of steel car orders which will be filled at this plant.

PRESSED STEEL CAR CO.'S REPORT FOR YEAR 1908.

The 10th annual report of the Pressed Steel Car Co. for the year ending Dec. 31, 1908, was submitted Wednesday at the annual meeting, by President F. N. Hoffstot. In his report he pointed out that the gross sales of the company for the year were $8,589,422.29. Of this amount, over 70 per cent was sold during the first three months. Decreased selling in the last nine months resulted in the freight car shops being practically idle. The net profits for the year were $265,477.59, all of which was from operation of the plants except $40,292.50, which was received from dividends on some securities held by the company. A total of $110,000 was charged off for depreciation and renewals, and a deduction made for dividends on preferred stock of $875,000. The total charged to surplus was $5,694,057.01. This compares with the following figures for 1907: Gross sales, $36,443,304; net profits, $2,907,920; total surplus for 1907, $6,413,579.42. As illustrating how seriously the business depression in 1908 affected the company, President Hoffstot said that at one time during the year there was in its employ, excepting the Canada Car Co., Ltd., only 10 per cent of the maximum number of workmen employed the year previous. Further he commented as follows:

That this was not exceptional is disclosed by statistics published in the trade papers, which show that apart from the cars railroad companies ordered and built in their own shops, only 39,000 cars were ordered in the United States from the car builders, as against an average annual requirement of, say, 200,000 cars. Practically no car orders were placed prior to Aug. 1, and most of them after Nov. 1, so that few, if any, of those orders were filled during the year 1908.

The profits for the first three months amounted to considerably more than the net profits for the entire year, but the idleness of plants due to lack of orders resulting from the serious business depression, and the fixed charges necessitated in holding together the important parts of your company's organization, reduced the earnings for the year. The usual ...eral charges have been made to expense account for renewals to plant and machinery.

As compared with 1907, the current assets, current liabilities and working capital are as follows:

	1908	1907
Current assets.....	$3,752,603	$9,406,293
Current liabilities	446,300	5,012,540
	$3,306,303	$4,393,753

At a meeting of the stockholders of the Youngstown Sheet & Tube Co., recently, they voted to increase the capital stock from $5,000,000 to $10,000,000. Of that amount, $3,000,000 will be distributed as stock dividends, and the remaining $1,000,000 of stock will be sold for cash. The money will be used to increase the working capital and to make additions now under contemplation.

BRITISH DEVELOPMENTS IN HIGH SPEED STEEL.

British metallurgists have displayed some excitement lately on the question of high-speed steel, owing to an announcement made by Prof. Arnold, of Sheffield, to the effect that Messrs. Jonas & Colver, of the Continental Steel Works, of which Sir Joseph Jonas is the head, have just produced a new high-speed steel, which, it is stated, is quadruple the efficiency of existing steels of similar type. The commercial use was postponed somewhat, owing to the litigation with American manufacturers, but the firm has now placed its steel on the market, and its cutting power is regarded as almost incredible.

Prof. Arnold has supplemented his statement in an interview with the London *Chronicle* in which he declared that the new steel involved a revolution from the scientific point of view. It would do more work than the old high-speed steels and would go on working at a greater heat than the old steel would stand. The professor explained that ordinary carbon steel would "let down" at a black heat of 250 degrees cent., whereas ordinary high-speed steel would go on up to 600 degrees, but the new steel would work up to 700 degrees. The most curious feature about it was that a steel quenched out in water should work with its edge at a distinct red-heat.

PERSONALS.

Harry D. Bayne, eastern manager of the Canadian Westinghouse Co., with headquarters at Montreal, has resigned his position.

F. H. Moyer, formerly at the Clairton Steel Co., has been appointed chief engineer at the Gary plant of the Indiana Steel Co.

Frank C. Harper has been made assistant secretary and assistant treasurer of the American Sheet & Tin Plate Co. with headquarters at Pittsburg. He was formerly assistant cashier of the Union Savings bank, Pittsburg.

D. Frank Crawford, general manager of the Tennessee Coal, Iron & Railroad Co., Ensley, Ala., and C. A. Stillman, the Birmingham, Ala., representative of Rogers, Brown & Co., have sailed for a six weeks' trip to the Mediterranean.

T. F. Cole, president of the Oliver Iron Mining Co., has been chosen to represent Minnesota on the inaugural reception committee to serve at the coming inauguration of President-elect Taft.

Bradley Stoughton announces the opening of an office at 165 Broadway, New York City, with a branch at Room 1007, Betz Building, Philadelphia, and another branch in Pittsburg. At present he is on a cruise to Bermuda.

William A. Rogers, of Rogers, Brown & Co., accompanied by Mrs. Rogers, sailed Saturday on the Kurfuerst of the North German Lloyd service for an extended cruise. Edgar S. Cook, president of the Warwick Iron & Steel Co., also sailed for Europe on that date.

Harry Vissering, who for 10 years has been general sales agent at Chicago, of the United States Metallic Packing Co., of Philadelphia, has resigned owing to growing interests in other fields. This also refers to his position as superintendent of the American Locomotive Sander Co.

W. C. Coffin has been appointed structural engineer for the Jones & Laughlin Steel Co., to succeed F. L. Garlinghouse, resigned; and R. A. McKean has been appointed superintendent of the company's Keystone Works. Messrs. Coffin and McKean were formerly connected with the Riter-Conley Mfg. Co.

The Standard Roller Bearing Co., Philadelphia, announces the appointment of F. M. Germane, formerly sales manager, as assistant general manager of the company; T. J. Heller as sales manager, and F. W. Lawrence as western representative, the last named with headquarters at Chicago.

John Cargill has associated himself with Robert W. Hunt & Co., consulting and inspecting engineers, in the New York office at 90 West street. He will largely devote his attention to the reports upon railway and other corporate properties. He was formerly associated with the Pennsylvania lines, the British Westinghouse and other organizations.

James R. Petley, treasurer and purchasing agent of the National Brake & Electric Co., Milwaukee, Wis., for the past several years, has resigned to become manufacturers' representative in Milwaukee and its vicinity. He will carry a full line of manufacturers', contractors' and founders' machinery and supplies, and will be located at 614 Caswell building, Milwaukee.

Seward Babbitt, secretary and general manager of the Lash Steel Process Co. and the Canadian Lash Steel Process Co., Ltd., has resigned his position with these companies and has returned into the organization of the International Steam Pump Co., as sales manager of gas engines and its producer department. Mr. Babbitt was previously connected with the International Co., and in returning, assumes practically the same position as before.

David J. Evans has resigned as manager of sales of the Chicago office of the Rail Joint Co., to take effect March 1. He will give his personal attention to the Andresen-Evans Co., an engineering concern which is developing new types of ore and coal unloading bridges, grab-buckets, etc., in which he has been interested since its organization. Mr. Evans was for a number of years connected with the Chicago office of the Lorain Steel Co., and also the North American Railway Construction Co.

OBITUARIES.

William Durst, manufacturer of brass goods, died Feb. 8 at his home in Brooklyn, aged 62 years.

Ambrose A. Tripold, proprietor of the Ambrose Machine Works, Eagle and Provost streets, Brooklyn, died Feb. 6, aged 48 years.

William Hilborn, prominent manufacturer of agricultural implements for many years at Ayr, Ont., died Feb. 7, in Toronto, from an attack of heart failure.

Robt. G. Brooke, general foreman of the machine shop at the General Electric Co.'s Schenectady plant, died Feb. 8, in that city, of paralysis. He was 60 years of age and had been connected with this plant for 23 years.

W. J. King, who had been employed in the clerical department of the Tennessee Coal, Iron & Railroad Co.'s offices at Ensley, Ala., died there Feb. 10, aged 32 years. He was born in Columbus, O., and previous to entering the Tennessee company's employ had been identified with banks in his home city.

Thomas Oliver, inventor of the Oliver typewriter, and president of the Oliver Cotton Harvester Co., died Feb. 9 from heart trouble, in Chicago, aged 56 years. He was born in Woodstock, Can., became a Methodist minister, and while pastor of a church in Iowa perfected his invention of the typewriter. He had recently perfected the cotton picker.

Stripping the Grant.—A contract has finally been let for the stripping by steam shovels of the Grant mine at Buhl, controlled by the Jones & Laughlin Steel Co. It was at this mine that an attempt was made to strip the ore body with an overhead cable and traveling clam-shell grab device. After three years in which very little was accomplished, the expensive plant installed has been abandoned for stripping purposes and a contract was made several days ago with Butler Bros. providing for the removal of 5,000,000 cubic yards, of which about 1,000,000 yards will be removed this year.

AMONG MACHINERY MAKERS.

PITTSBURG.

Lively Competition for Orders—Some of the Contracts Awarded.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., Feb. 16.

Spirited competition among makers is a notable feature of the machinery market. The result is a condition of close figuring and low prices which is working to the advantage of buyers. It is estimated that, by awarding contracts at this time, the officials in charge of several important plant projects in this district have netted a decided saving in equipment cost for their respective companies. The market is making no particular advances, and though a very fair amount of inquiries is being offered regularly for estimate, there is still a reluctance to place contracts. Machine tools are no livelier. The roll makers report improvement.

Among the principal buyers now in this market is the Pittsburg-Buffalo Co., which is ordering much equipment for its Marianna mines, and the West Penn Steel Co., which is closing for its rolling mills and other requirements for its new steel works and sheet mills at Brackenridge, Pa.

W. B. Scaife & Sons Co., Pittsburg, manufacturer of the We-Fu-Go and Scaife water softening, purifying and filtering systems, has found it necessary to build an addition to its present plant at Oakmont, Pa., to accommodate its increased business in the building of systems for the purification of water for steam boilers, industrial and domestic uses. The company is about to begin the erection of a shop 40 x 200 feet equipped with the latest improved machinery, which will be used in addition to the present plant for manufacturing the We-Fu-Go and Scaife systems. The Scaife company has under construction at the present time for steam boiler plants, systems aggregating 95,000 horsepower, in addition to plants for softening and clarifying water to be used in manufacturing processes such as dyeing and bleaching in woolen and cotton mills, and for washing in laundries, as well as a number of mechanical gravity filter systems for manufacturing and domestic use. Among some of the recent contracts taken by this company are the following: Pittsburg-Buffalo Co., Canonsburg, Pa., 1,000 horsepower system; Merchants Ice & Cold Storage Co., Terre Haute, Ind., 750-horsepower system; Auburn & Syracuse Electric R R. Co., Auburn, N. Y., 750-horsepower system; Columbia Plate Glass Co., Blairsville, Pa., 3,000-horsepower system; John A. Manning Paper Co., Troy, N. Y., 750-horsepower system; Natrona Water Co., Natrona, Pa., 500,000-gallon mechanical gravity filter system; Edwards & Chapman, Springfield, Ill., 3,000-gallon per hour system; and Jenner-Quemahoning Coal Co., Holsopple, Pa., 6,000-gallon per hour system.

The Westinghouse Machine Co., East Pittsburg, Pa., reports a number of contracts placed for the Westinghouse-Leblanc condenser, the American adaptation of the type of condenser which has been so favorably received in Europe. Most of the contracts are in connection with new turbine equipment. The Narragansett Electric Light Co., Providence, R. I., is installing two units, 7,000 horsepower, in connection with new turbine equipment. The B. F. Goodrich Rubber Co., Akron, O., has ordered one unit in connection with a new turbine for its central power plant. This company was among the pioneers in the use of the Westinghouse turbine, and heretofore most of its experience has been with the surface type of condenser. The Coronet Phosphate Co., Plant City, Fla., has ordered three units for use also in connection with turbines, the Portland Cement Co., Trinidad, Colo., the city of Logansport, Ind., and the Bristol (Tenn.) Gas & Electric Co., one unit each. Other equipments are being built for the Jersey Central Traction Co., the Washington & Mt. Vernon railway in connection with its new turbine plant, and the Cleveland Electric Co., which equipment is about to go in service.

The Pittsburg-Buffalo Co., Pittsburg, has recently been a heavy buyer of miscellaneous machinery for its new model mining plant at Marianna, Pa., and is still in the market for considerable equipment. The company has ordered two Ingersoll-Rand compressors, 20 x 34 inches, steam end, and 32 x 20 inches air end by 30 inches stroke, with a capacity of 3,400 cubic feet per minute. Two compressors were also awarded the Mesta Machine Co., Pittsburg, as previously reported. The Pittsburg-Buffalo Co. will also install 300 air punching mining machines and 25 under cutting machines which will be divided among the Ingersoll-Rand Co., New York, Sullivan Machine Co., Chicago, and the Geo. E. Whitcomb Co., Chicago. The company has yet to place contracts for a 30-foot fan with a capacity of 790,000 cubic feet of air per minute, which will be driven by two Corliss cross-compound engines capable of generating 3,000 horsepower, either of which may be operated as a single engine. The contract for this power unit has not yet been given. A six-dump tipple of steel construction and a 1,000-ton washer plant will also be erected. A tonnage of light rails and a number of steel mine cars have been ordered by the company.

The Carnegie Steel Co. during the week placed an order for two electric cranes of 10-ton capacity and 75-foot span which are to be installed in the structural yards of the Ohio works, Youngstown, O. The cranes are of special design.

The Blue Island Car & Equipment Co., West Pullman, Ill., has closed for 10-inch and 18-inch merchant bar mills with shear and miscellaneous equipment to be installed in a new rolling plant which will be operated in connection with its other manufacturing activities. The United Engineering & Foundry Co., Pittsburg, has been awarded the contract for this machinery.

The Jamison Coal & Coke Co., Pittsburg, is enlarging its power capacity at its Nos. 2 and 3 plants in the Greensburg field. Two Heine boilers are being installed at the No. 2 plant and one of similar make at the No. 3 works.

The Standard Tin Plate Co., Canonsburg, Pa., announces that it has decided to add four additional hot mills to its present capacity.

MILWAUKEE.

Smaller Concerns of the State Busy —Encouraging Outlook.

Feb. 15.

It seems to be the general opinion that the smaller machinery manufacturing plants of Wisconsin are the ones at the present time which are running at full blast with a quota of orders that compare favorably with any period before the late money stringency. While the large plants of the state are meeting with a business that is gradually improving, the improvement is taking place more slowly and they have not arrived at a stage so near the normal output as is the

case with the smaller concerns. Reports received from manufacturing plants at Beaver Dam, Manitowoc, Beloit, Janesville and other cities of the state give a most hopeful outlook to the machinery manufacturing situation of the state at large.

Plants located just outside of the state also seem to be busy. Several concerns at Menominee, Mich., report that steady improvement is taking place and that the prospects for the near future are exceedingly bright.

"Business is steadily improving," said F. G. Fernstrum, a veteran boiler manufacturer of Menominee. Mr. Fernstrum is employing a large crew steadily, although his force is not quite as large as it was a year and a half ago. He has a large plant, but is planning to enlarge it by the erection of a new structural iron establishment in the near future.

The big plant of the Prescott Mfg. Co., the saw mill manufacturing concern at Menominee, is now being operated on a day and night schedule at full capacity. The business has been increasing constantly of late.

It is understood that the R. J. Preuss Woven Wire Co., of Milwaukee, is making negotiations for the erection of a new $50,000 factory at West and Dover streets.

The board of public works at Waukesha, Wis., is preparing a $26,000 bond issue for the erection of a large storage tank and the replacing of 17,808 feet of water mains with cast iron pipe. Plans have been received for the erection of a new Broadway bridge in the city, one third of the cost of which the Milwaukee Light, Heat & Traction Co. will pay.

The machine shop of George Beyer at New London, Wis., has been sold to Milo Smith and Herman Bolinski, who will manufacture Mr. Beyer's newly invented governor clutch for cream separators.

With a loss of $10,000, the machine department of the Oshkosh Boat works at Oshkosh, Wis., was recently destroyed by fire. The entire plant narrowly escaped destruction. The loss includes a large amount of valuable machinery, tools belonging to workmen and half a dozen completed launches.

CINCINNATI.

Improvement in Demand for Machine Tools is Encouraging.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Feb. 16.

An improvement in the demand for machine tools in the past two weeks is reported by manufacturers and dealers. While there is much room for betterment in the trade, still the orders that have been received in the first half of February have given manufacturers considerable encouragement The sales have been for prompt delivery and where the customer was located at some distance the orders have come by wire in order to hurry the machines forward. There is an improved inquiry from the west and several orders from western centers have come in, which is taken as an indication that business in that section of the country is picking up. The orders cover all classes of tools and the heavier types have been called for as well as the lighter lines. But little is said of foreign orders in these days, but one of our manufacturers reports a better call for machines from abroad than for some time. Boiler makers find business keeping along about the same way as for some time past. A few orders are coming along all the time, and there is enough of this with repair work to keep things going on a moderate basis. Foundries are irregular in their reports. Some find business dull, others have a fair amount of business, but on the whole the melt of iron has not increased materially since the first of the year.

Several of the local machine tool builders entertained at luncheon this week, at the business men's club, J. A. Bennett, of Hartford, Conn., who has just returned from China and Japan. Mr. Bennett has made a study of the conditions in the Orient in reference to that part of the world as a market for machine tools and as to the methods to be employed in selling machines there. He reports that while the present conditions there are much like they are here, in a depressed state, the possibilities are good for developing a trade with these people: Those present at the luncheon were: William Lodge and Murray Shipley, of the Lodge & Shipley Machine Tool Co.; Fred A. Geier and C. Wood Walter, of the Cincinnati Milling Machine Co.; George Gradolf, of the Bickford Drill & Tool Co.; B. B. Quillen, of the Cincinnati Planer Co.; A. Tuechter and Sherman Schauer, of the Cincinnati Machine Tool Co.

The incorporation papers of the newly formed consolidation of the Cincinnati Machine Tool Co. and the Bickford Drill & Tool Co. were filed this week. The incorporators are Aug. H. Teuchter, Sherman Schauer, W. H. Shafer, W. T. Hall Jr., and Lewis N. Gatch.

The Cincinnati Lathe & Tool Co. received some orders last week, three coming from the west. The management says, if February keeps up as well as it has started, the shop may be put on full time and full force.

The Cincinnati Machine & Tool Co. reports a satisfactory week and that February has been a good month so far.

The Hisey Wolf Machine Co. notes a decided improvement in orders and the amount of correspondence and inquiry is encouraging for a continuance of improvement.

The Kern Machine Tool Co. advises that some picking up in foreign orders has been noted lately and the domestic inquiry is better.

One of the large dealers says that sales this month have been the best for some time.

Model Loft Buildings.—The Bush Terminal Co., 100 Broad street, New York, has issued a handsomely illustrated booklet descriptive of its series of loft buildings which adjoin the Bush docks on the South Brooklyn waterfront. It is entitled "Model Loft Buildings for Shipper and Manufacturer," and presents a vivid picture of the marvelous growth of the Bush community. Bush Terminal is the nearest approach to a union freight station that exists in greater New York. The entire plant covers 200 acres on the Brooklyn water front. There are seven piers, the largest in the port, which are occupied by steamship companies operating vessels of the largest tonnage. There is the Bush Terminal, operating 20 miles of track. There are 122 warehouses and the series of loft buildings. The latter are being occupied by manufacturers who have found it uneconomical to carry an open stock of merchandise in Manhattan. They maintain stock rooms in Bush Terminal but direct the movement of merchandise by telephone from their offices in the city. As the terminal company is the accredited agent of the various railroads entering New York and as the freight cars of all these roads are brought by lighters to the doors of the loft buildings, a tenant is saved all expense of cartage to and from such as would be necessary if the building were in Manhattan. All a shipper has to do is to pack his goods and press the button that will bring an elevator to his floor. The goods are in process of shipment immediately, a bill of lading being issued at regular New York rates. The arrangement has proven to be

a great money saver, especially in the case of large firms among which may be mentioned the Fairbanks Co., Fairbanks, Morse & Co., Republic Metalware Co., Faulkner, Page & Co., William Iselin & Co., A. A. Vantine & Co. and others.

AMERICAN IRON & STEEL CO.'S ANNUAL REPORT.

The ninth annual report of the American Iron & Steel Mfg. Co., Lebanon, Pa., for the year ending Dec. 31, 1908, has been presented. In making public the report, Arthur Brock, chairman of the board of directors, said:

The year was one of very considerable depression in the iron and steel industries, and your company had to bear its share of the curtailment of production and shrinkage in prices. It was, however, deemed wise to continue to make improvements to plants and equipment, and $156,593.09 was expended for these purposes. The allowance for depreciation of plants and machinery now amounts to $764,000, which sum has been deducted from the value of real estate, plants, and equipments.

The condensed balance sheet of the company, as on Dec. 31, is as follows:

ASSETS.

Current Assets:		
Cash in banks		$1,488,851.68
On hand		500.00
Total		$1,489,351.68
Bills receivable		1,051.34
Accounts receivable, net		591,009.43
Inventory		1,560,005.02
Insurance and taxes, unexpired value		5,887.17
Total		$3,647,304.64
Fixed Assets:		
Real estate, plants and equipments		$5,493,278.74
Less allowance to provide for depreciation		764,000.00
Total		$4,729,278.74
		$8,376,583.38

LIABILITIES.

Current Liabilities:		
Wages—accrued, not due	$	69,957.66
Accounts payable		275,769.84
Total	$	345,727.50
Capital Liabilities:		
Capital stock—		
Preferred, authorized and issued		$3,000,000.00
Common, authorized and issued		2,550,000.00
Total		$5,550,000.00
Undivided profits at this date, subject to the payment of dividends on preferred and common stock, authorized but payable Jan. 1, 1909		2,480,855.88
Total		$8,030,855.88
		$8,376,583.38

AMERICAN CAN CO. MADE GOOD SHOWING.

The annual report of the American Can Co. for the year ending Dec. 31, 1908, makes a comparatively good showing, considering the extreme industrial depression of the year. While it operated at less capacity, yet it made a new high record in net profits. The net profits were $2,706,264, the largest in the history of the company and equal to 5 per cent on the preferred stock and 1½ per cent on a like amount of common stock.

President William T. Graham said in presenting the report:

An increase in the aggregate value of plants, new construction, and investments of $139,752 is shown for the year, but new construction and extension have greatly exceeded that amount. Cash, receivables, and inventories, less accounts and dividends payable, which represent working capital, have increased by $522,472.

In connection with Th. Goldschmidt, of Essen, Germany, our company has recently secured the organization of the Goldschmidt Detinning Co. for the purpose of building plants for detinning scrap under a process which has great advantages over any other process heretofore used in the United States, and has contracted on satisfactory terms to sell the said Detinning company its output of scrap for a term of years.

The volume of business is not yet back to the record of 1907, but there is a fair promise of further improvement in the outlook for 1909.

ANNUAL REPORT OF J. G. BRILL CO.

The annual report of the J. G. Brill Co., Philadelphia, for the year ending Dec. 31, 1908, shows that the output from the five plants amounted to $3,845,173. The decrease in total sales as compared with 1907 was $5,366,652. After deducting operating expenses and charging off for repairs, etc., the profits amounted to $188,830.

In presenting his report, President James Rawle said:

During this year of unprecedented depression the financial condition of your company has been excellent, and the accumulated surplus, as above stated, has enabled the directors to pay during the year the dividends to which I have referred.

The outlook for work is much improved, although competition is extremely keen. We have orders in hand as of Feb. 6, amounting to $1,717,338; Danville Car Co., $78,277; total, $1,795,615.

On April 1, 1908, a majority of the stock of the Danville Car Co., located at Danville, Ill., was acquired. This plant is now getting in a satisfactory running condition under the management of your company, and its output from April 1 to the end of the fiscal year amounted to $98,036.

These directors were re-elected: Francis E. Bond, Edward Brill, M. H. Brill, Robert K. Cassatt, S. M. Curwen, F. W. Rawle and James Rawle.

PROF. ARNOLD PREDICTS AN ALUMINUM AGE.

In a lecture given on Jan. 28, before the Royal Institution of Great Britain, Prof. T. O. Arnold, of Sheffield University, taking for his subject "The Mysteries of Metals," discussed the future of iron and steel. He said that though none of his audience would live to see any serious change with regard to iron supply, it was true, speaking geologically, that both the coal and iron of the world must be exhausted in a very short time. The world without iron or an efficient substitute for it would in half a century drift back almost to the status of primitive man. In his opinion, the coming age would be the aluminum age since the crust of the earth contains an average of 15 per cent of alumina. Of course, aluminum, as we know it now, could not take the place of iron and steel, but it was more than probable that metallurgical research would reveal to future generations some element which, alloyed with aluminum in relatively small quantities, would produce a metal equivalent to steel for structural purposes. For cutting purposes, however, it would seem advisable to conserve some of the world's iron.

RECENT CUSTOMS RULINGS.

The United States circuit court of appeals, second circuit, held that polished steel plates intended to be engraved upon are steel plates within the meaning of paragraph 135 and dutiable at specific rates according to value.

The board of general appraisers held that oxide of iron, or hematite iron ore, which is in a powdered state resulting from a process of grinding and levigation, is dutiable under paragraph 58 of tariff relating to colors and pigments rather than paragraph 121 as iron ore.

In protests of Buehne Steel Wool Co., steel shavings were held by the board to be dutiable as manufactures from wire rather than as manufactures of metal.

Gaskets composed of metal and asbestos, metal chief value, were held to be dutiable as such at 45 per cent rather than as asbestos at 25 per cent.

Narrow strips of steel for needle books, each carrying a row of needles, hand sewing, were held dutiable at 45 per cent by the board and the needles free.

Propery Transferred.—Two deeds transferring the plants in Norwalk, O., of the Norwalk Steel & Iron Co., and the William Kavanaugh Co., to the recently formed Huron Iron & Steel Co., have been filed. A mortgage given by the Huron Steel & Iron Co., of Maine, as the holding company, and the Huron Steel & Iron Co., of New York, as the operating company, to the Cleveland Trust Co., trustee, covering $5,000,000 in bonds, of which $1,250,000 is immediately effective and $250,000 is available for working capital, was also filed. The New York concern is to furnish principal and interest on bonds which expire in 1929, while the Maine corporation is to hold in trust the property recently purchased at a bankrupt sale.

The Struthers Furnace Co. blew in its Anna stack Jan. 11.

HISTORIC WORKS

At Morristown, N. J., Visited by Fire —Forging in the Old Days.

A fire which destroyed the main building of the old Speedwell works, at Morristown, N. J., the early morning of Dec. 7, last, obliterated almost all that remained of an establishment which played a most interesting part in the early development of American mechanical industries. All that now remains of these historic works is a small office structure and a building shown in the accompanying cut, in which the electric telegraph was invented and constructed. In this building was developed through the combined efforts of S. F. B. Morse and Alfred Vail, the wonderful system, with instruments and alphabet in dots and dashes which today, with refinements and additions, connects almost every portion of the inhabited globe. Here were sent the first telegraphic message and reply, historic forerunners of those of today which span land and sea, annihilate time and distance and enable the newspapers to print a complete record of the world's doing of yesterday every morning, and the merchant prince to sit in his office and direct the manufacture and marketing of his wares in every part of the world.

These works date back to the momentous year 1776, when they were established by Isaac Arnold as a "bloomery." The basis of the establishment was the existence of a water power sufficient to operate trip hammers for forging and the other simple machinery of that time for what was considered at that early period "heavy forgings." The location was advantageous, as Morristown was midway between the iron mines of New Jersey, then and for many years the most important source of this metal in America, and the rapidly growing seaport and metropolis of New York.

The great development of the Speedwell works took place, however, under Judge Stephen Vail, who came into possession of them in the year 1800. Under Judge Vail's administration, the works became a famous forge and manufactory of heavy machinery. Here was built the machinery for the steamship "Savannah," the first steam-driven vessel to cross the Atlantic. The "Savannah" was built for the Steamboat Co. of Georgia. It registered 350 tons. The hull was built by Pickett & Crocket, at the foot of Pike street, New York, and the boat was taken to Elizabethtown Point, now Elizabethtown, N. J., to have the machinery put in. David Dood, of Elizabethport, made the boiler, and Isaac Stevens, of Water street, made the copper and steam fitting work. The castings in those days were made at Elizabethport and sent to Morristown for machining. They were carted back and forth by horses. It is interesting to note that the cost for transportation was only about the same as it is today by rail.

The "Savannah" was built with the idea of selling her to the Russian government. It was sent to Liverpool for that purpose.

Judge Vail had to design and construct all his large tools. There was a planer with a platen 15 feet long and 6 feet wide. The shears were planed on a saw mill carriage. Some of the tools had shears made of wood and faced with iron. There was a lathe with a 10-foot swing. The shears were made of cast iron. The boring was done in the lathe.

There are many relics of the "Savannah" in the old Vail homestead now owned and occupied by John H. Lidgerwood, of the Lidgerwood Mfg. Co., of New York. W. V. V. Lidgerwood, president of the Lidgerwood Mfg. Co., and John H. Lidgerwood, were stepsons of Judge Vail.

One of the specialties that the Speedwell works produced was screws for cotton presses. These were made as long as 12 feet and 5 inches in diameter. The method of making these was a secret. Alfred Vail had charge of this work. Mr. Vail became ill and decided to leave the works and become an Episcopal minister. For this purpose he entered the University of New York. Here he met Morse and became interested in working out the idea of the telegraph. They went to the Speedwell works and fitted up the building shown with many feet of wire and began their experiments. It was largely due to Mr. Vail's mechanical skill that this work was successful. Mr. Vail invented the sending key and when the necessity for an alphabet became apparent, he invented what is known today as the "Morse" alphabet.

BUILDING IN WHICH MORSE TELEGRAPH WAS DEVELOPED.

When all was ready Mr. Vail invited his father to write a message to be sent to Mr. Morse, who was ready to receive it on an upper floor. Judge Vail, having in mind the long time that the work had been in hand, wrote "a patient waiter is no loser." The message was sent to Mr. Morse and repeated back to Mr. Vail. "What

a great thing that will be in time of war!" Judge Vail exclaimed when the message came back.

The Speedwell works continued for many years to make forgings for steamboats and later for locomotives, including cranks, tires and such parts. Sugar mill machinery and plantation machinery, such as coffee hulling machinery for Brazil, later became a specialty. After Judge Vail's retirement the works were carried on by George Vail & Co., and finally Isaac Canfield and John H. Lidgerwood acquired the business and ran it under the title of Canfield & Lidgerwood. W. V. V. Lidgerwod also established works at Coatbridge, Scotland, for the manufacture of work for Brazil.

The Speedwell works were operated up to 30 years ago, when they were finally abandoned. By this time W. V. V. and John H. Lidgerwood had become interested in the manufacture of hoisting engines and the scene of their activities was shifted to Brooklyn, where the works of the Lidgerwood Mfg. Co. were established.

BOUNTIES FOR AUSTRALIAN IRON.

Sydney, New South Wales, Jan. 21.—After some 25 years, the pioneer work spent on the upbuilding of an iron industry in Australia is likely to come to fruition. Whatever the immediate future may hold forth in the matter of profits in iron manufactures here, because of the new bonus bill with its liberal provisions, there seems to be every reason to believe in its permanency. The schedule provides for payments totaling £304,000 ($1,500,000) for various classes of products, extending up to the year 1913.

It was quite evident that the iron industry in this newly settled country could not survive unaided; the wonder was that it survived so many vicissitudes and adverse circumstances so well. With fine persistence and indomitable pluck the works at Lithgow, N. S. W., have been kept going, and now the assistance of a 12 per cent bonus has been granted, the outlook should be considerably brighter. It should be interesting to watch the development of staple industries connected with iron manufactures, especially in agricultural and mining pursuits. A large contract for steel rails, crossings and switches, has just been accepted by the Victorian state government, for the railways, and, as in addition to the 12 per cent bonus, a preference rate of $5 per ton is allowed, the Lithgow management should have no difficulty in competing with the imported goods.

The latest notion for the encouragement of Australian mining and smelting industries is the imposition of a tax on all the ores exported. However, the parliament does not resume until May, and many other more important matters have prior claims on the attention of our legislators.

MANUFACTURERS' TAXES

May be Increased if Bills Pass Pennsylvania Legislature.

Harrisburg, Pa., Feb. 13.—Manufacturing corporations, whose capital stock has been exempt from taxation in Pennsylvania, will be forced to pay a tax of from 5 to 10 mills on the dollar if bills presented in the Pennsylvania legislature recently become laws. Several new taxation schemes have been suggested because of the necessity of increasing the state revenues because of the demands for road construction, tuberculosis campaigns, charitable and educational projects, and it is possible that the rates will either be advanced or else property of a personal nature made liable to assessment.

Two measures of importance to manufacturing corporations, especially iron, steel, coal and other companies operating under Pennsylvania charters, are now in committee. One provides for a tax of 10 mills on the stock of all corporations, including those now exempt, while another increases the tax of 5 mills now levied on the stock of all corporations but manufacturing to 10 mills.

A bill has also been presented for the appointment of a state taxation commission, which is to study the tax laws of the state and report to the legislature of 1911 a more equitable code.

In his report on the finances, Auditor General Young, who is in charge of collection of taxes, recommends a commission and suggests among other sources of possible revenue taxation on the stock of manufacturing corporations.

TARIFF AGITATION HURTS BUSINESS.

Five of the nine active stacks owned by the Thomas Iron Co., Easton, Pa., are now in blast. Three of the others are being repaired and will be ready for blast in March, though from present indications they will not be blown in at that time. In this connection the following statement to THE IRON TRADE REVIEW from President B. F. Fackenthal, Jr., is interesting:

"When we gave instructions to have these stacks relined and prepared for blast, just after the elections, business looked very bright and encouraging; we were taking additional orders at higher prices. But we are free to confess that the outlook is not quite as bright now as it was at that time, due, as we believe, in large measure to the tariff agitation. We expect to go ahead and get our furnaces ready for blast, but will not start them until conditions are somewhat changed, or until we have a better idea as to what the ways and means committee will do in regard to the tariff on pig iron, because merchant blast furnaces along the Atlantic coast would, in my judgment, be forced into liquidation, if the duty on pig iron were removed. It seems very unfortunate, from our standpoint, that this tariff tinkering should take place on the heels of a panic, just when conditions had commenced to improve."

Italian Production.—The production of iron ore in Italy in 1907 amounted to 536,826 tons, compared with 404,717 in 1906. The production of coke was 38,000 tons in 1906 and 35,000 tons in 1907. The production of manufactured iron and steel was as follows: Iron—Sheet bars and shapes in 1907, 228,340 tons; in 1906, 218,985 tons. Agricultural implements and hardware, wire nails and rivets, bolts, nails, forgings, etc., in 1907, 19,809 tons; in 1906, 17,856 tons. Steel—Sheets, bars and shapes in 1907, 189,740; in 1906, 200,640 tons. Rails, bolts and nuts, forged anl rolled blooms and ingots and other steel products, in 1907, 143,119 tons; in 1906, 117,211 tons.

Brown Ore Sale.—Vance and Henry B. McCormack, Pennsylvania investors, have purchased for $180,000 the properties of the Eureka Mining & Development Co., which includes two mines and 420 acres of brown ore at Russellville, Ala. The mines have been operating for 15 months and have a daily capacity of 500 tons. P. J. Hannon is president and W. H. Beatty general manager of the Eureka company.

The total production of iron ore in Sweden in 1907 was 4,478,917 tons from 294 mines, a decrease of 23,000 tons compared with 1906; the production of pig iron was 615,778 tons by 130 furnaces, an increase of 10,989 tons, and the production of wrought iron and steel from 91 works was 594,621 tons, or nearly 19,000 tons more than in 1906.

THE GRONDAL METHOD OF BRIQUETTING ORE[1]

A Description of a Process Largely Employed on European Ores, and Statements of Results There Obtained

By N. V. Hansell.[2]

In a previous article the Grondal process of separating iron ores has been discussed, and the advantages of the method have been shown. How great the difference between dry and wet crushing is,—a difference that cannot be too strongly emphasized—has been pointed out. Prior to dry crushing, the ore generally has to be dried, and in the grinding a large amount of dust is produced, causing heavy wear on bearings and transmissions and making the buildings more or less unsuitable for occupation. The separation itself is also affected by this, because, however dry the ore may be, dust and smaller grains mechanically stick to the ore particles, making a thorough separation difficult.

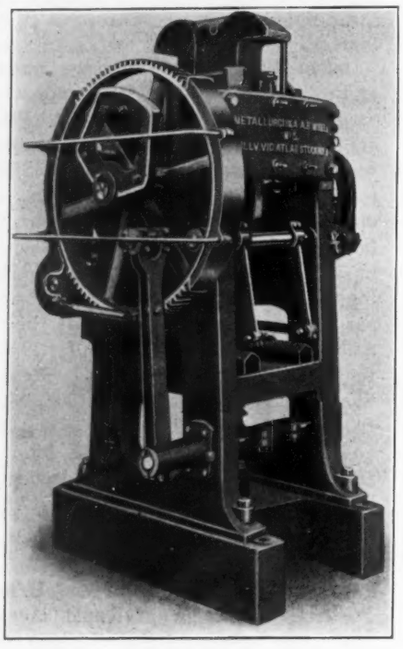


Fig. 1—Front of Briquetting Press.

The simplicity of the wet crushing and concentration, compared with the dry, is apparent. The ensuing briquetting of the wet concentrates as developed in the Grondal method, makes the whole process unique in its completeness, by making it feasible to transform into a product equal or superior to the best iron ores found anywhere, a raw material which through its leanness and impurities heretofore has been considered absolutely valueless.

In the Grondal separating plants, the rule generally is to carry the separation to as high a degree as possible, often bringing the iron contents to 67 or 70 degrees. In most cases, this is not possible, except by fine grinding of the ore, producing very finely granulated concentrates. By the briquetting process this is converted into a form most suitable for charging into blast furnaces.

The Briquetting Process.

From the finely pulverized ore, whether obtained by magnetic separation, as residues of pyrites, burnings, or as flue dust, briquettes are formed by a drop-press of modified construction. They are thereafter heated in a horizontal channel kiln with a movable bottom, composed of the cars on which the briquettes are loaded. The first kiln of this type was built at Bredsjo in Sweden in 1902 and since 27 kilns have been erected in Sweden beside a great number in Norway, Spain, Italy and England, to which the last year has been added one in the United States. At present over 330,000 tons of briquettes are produced in Sweden per year and perhaps an equal amount outside of Sweden.

Since the first kiln was put in operation, a number of improvements have been made in the general arrangement of the kiln, raising its capacity and lowering its fuel consumption as well as in the construction of details of the machinery, standardizing same and lowering the repair costs. The results which have been obtained are such that it can be safely stated that the briquetting problem is fully and successfully solved.

The ore delivered from the separating plant has in the de-waterizer been given the correct plasticity for the briquetting—it contains 6 to 8 per cent of water. From a hopper it is fed to the press, which in the Swedish practice forms briquettes of generally 6 x 6 x 2½-inch size. The construction of the press can be seen in Figs. 1 and 2. The plunger is lifted by a two-throw cam so that each briquette receives two blows. The height of drop is from 6½ to 7½ inches, the falling weight being 1,600 pounds. Each press has a capacity of 10 to 12 briquettes per minute. The briquettes are placed on flat cars illustrated in Figs. 3 and 4, built of iron with a cover of fire brick. At one end, each car is furnished with a groove, at the other, with a projected rib, so that when they are pushed together on the same track, they will form one continuous platform. The wheels have roller bearings and are lubricated with graphite or oil. The briquettes are placed on edge two tiers high; each car of the modern type 6 feet 6 inches long by 5 feet wide, has a capacity of 250 briquettes of an average weight of 9 pounds.

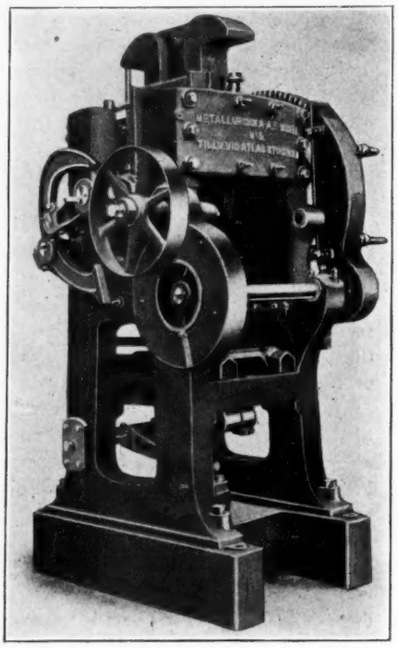


Fig. 2—Back of Briquetting Press.

The loaded cars are pushed one at a time into the briquetting kiln, which is 140 to 150 feet in length. It is fired with gas, the combustion chamber being 80 to 100 feet from the charging end. The cars are fitted at their sides with angle iron flanges which dip into channels filled with sand running the whole length of the kiln. The row of cars thus constitutes an air tight horizontal partition below which cooling air is admitted to keep the wheels

[1]This article is to be considered in connection with a description in last week's issue of the Grondal concentrating method.

[2]Member of the engineering firm of Hamilton & Hansell, 29 Broadway, New York City.

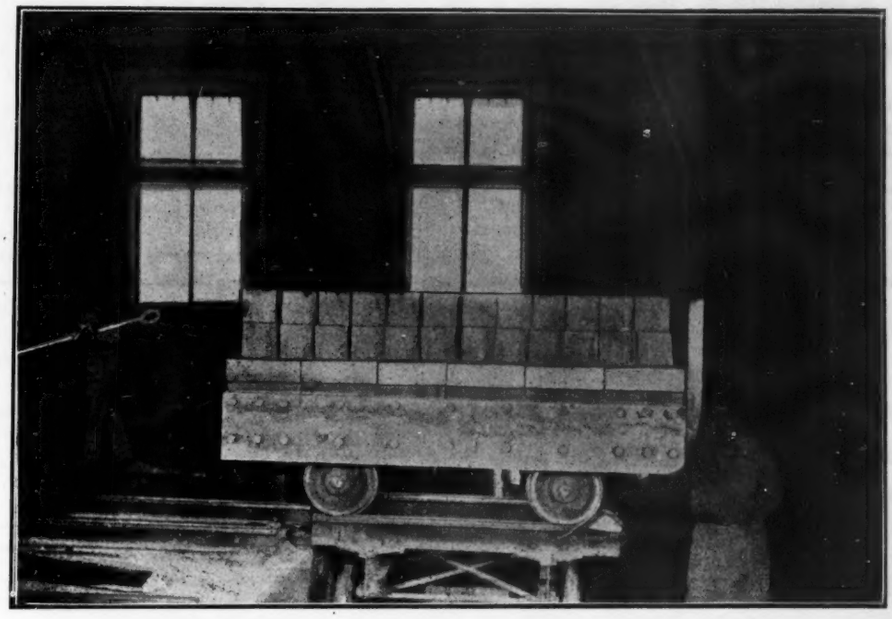


FIG. 3—CARLOAD OF BRIQUETTES, SHOWING SIDE FLANGES ON CAR RUNNING IN SAND CHANNELS.

and the frame work of the cars from being overheated.

The air for the blast is heated in a room over the arched roof over a part of the discharge end of the kiln. It is forced through this by means of a fan and enters the kiln at a temperature of about 570 degrees Fahr. When passing into the kiln it is thoroughly mixed with gas in a way similar to that of an open hearth furnace. The gas employed can be either blast furnace gas or producer gas. When very great heat is required, as for instance when burning high sulphur or hematite ores, blast furnace gas is usually not sufficient but is used in connection with producer gas. From the plant at Sandviken, Sweden, A. Johanson (Jernkontorets Annaler) 1908, pp. 400-430, gives the following analysis (volumes):

	Blast furnace gas, per cent.	Producer Gas, —Two Analyses— per cent.	per cent.
CO_2	6.7	1.2	2.0
O	0.2	0.7	0.8
CO	28.3	29.3	29.8
H	5.7	16.3	12.4
CH_4	0.0	0.0	0.6
N	59.1	52.5	54.4
	100.0	100.0	100.0

The temperature of the former when reaching the kiln is 340 degrees Fahr., although in summer time higher; if in freezing weather only 70 degrees, depending on cooling in the 240 feet long piping from the blast furnace. The outgoing combustion gases from the kiln show an analysis of (average from seven determination):

CO_2	13.6 per cent
O	2.2 per cent
CO	0.3 per cent

Their temperature when entering the stack has varied from 212 to 260 degrees Fahr.

The amount of fuel usually required when using producer gas alone varies from 5 to 7 per cent of the weight of briquettes produced. The capacity of a Grondal kiln is, of course, dependent upon the character of the ore treated and the degree of desulphurizing required, but can be estimated in the modern kiln at 50 to 75 tons per day of 24 hours. At the Sandviken plant, which consists only of one furnace of the narrow type, three men and one boy are used per shift of 12 hours. They do the following work: Two men take care of the presses, load the cars, charge them, discharge them and unload them. One man takes care of the producer and assists at the presses. The boy is stationed in the bin, where he moistens the concentrates to the right percentage and feeds it t. the presses.

The total cost for the briquetting including labor, fuel, power and repairs has during one year continuous operation been at Sandviken 77 cents

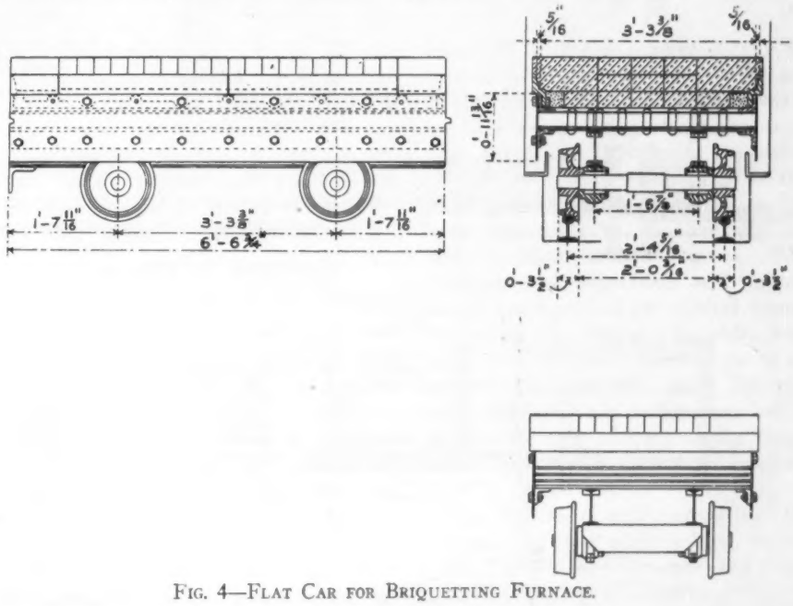


FIG. 4—FLAT CAR FOR BRIQUETTING FURNACE.

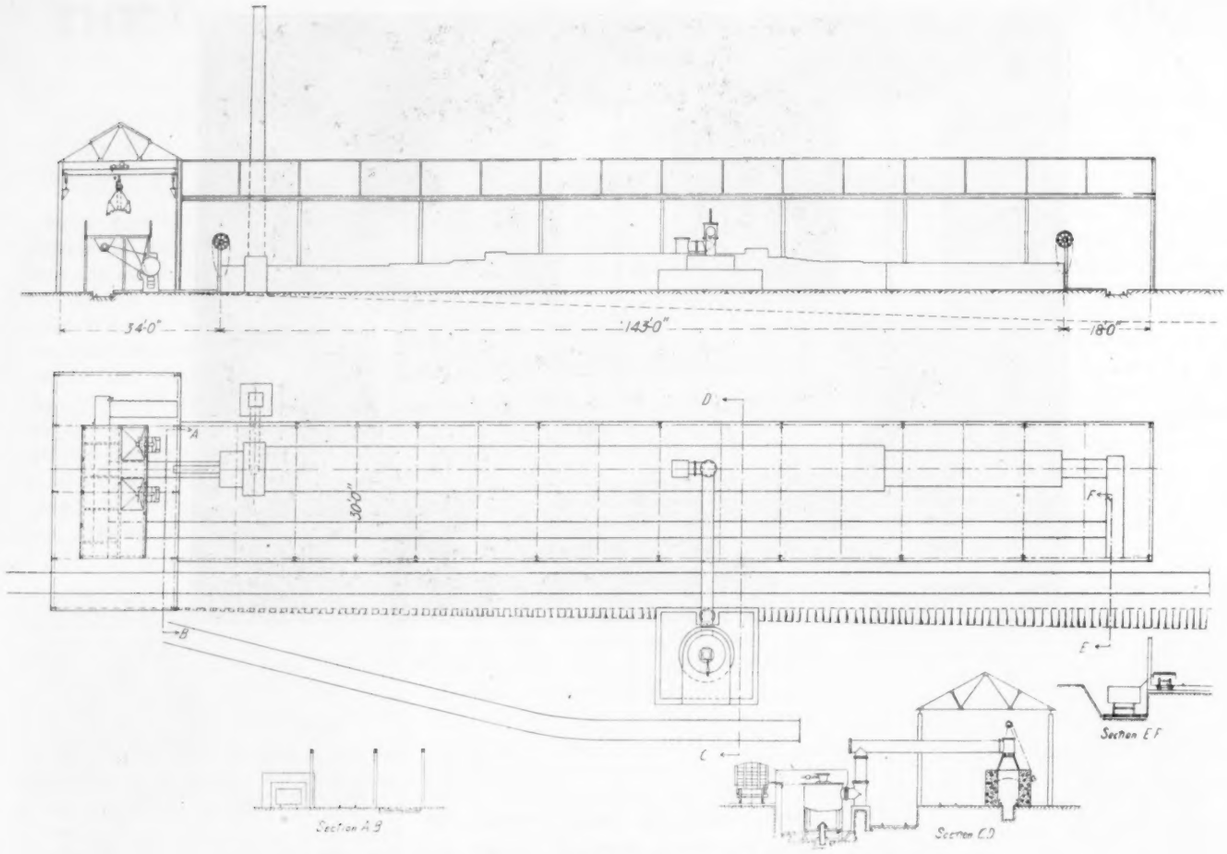


FIG. 5—GENERAL ARRANGEMENT OF 1½-METER GRONDAL BRIQUETTING FURNACE.

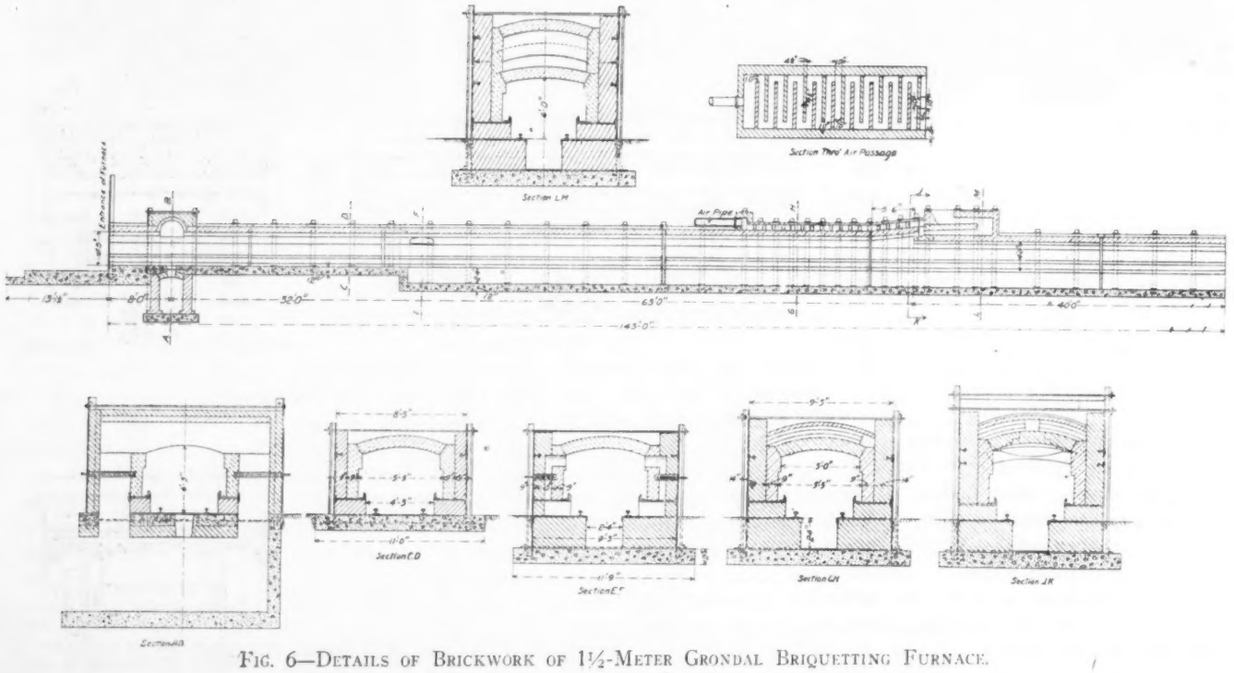


FIG. 6—DETAILS OF BRICKWORK OF 1½-METER GRONDAL BRIQUETTING FURNACE.

per ton of briquettes. At other plants where two or more furnaces are in operation the figure has been brought down to as low as 60 cents per ton, all charges included. As pointed out, the Sandviken kiln is of the narrow type, only 3 feet 9 inches wide. The modern kilns are built 5 feet wide, as for instance those at Strossa, Sweden. The Strossa plant consists of six kilns arranged in three batteries of two kilns in each battery. This plant is producing 80,000 tons briquettes yearly. Among plants under erection may be mentioned the Syd Varanger, which when completed, will contain 40 kilns, and the one at Salangen with 20 kilns. Both these are located in Northern Norway, the Syd Varanger plant about 400 miles north of the Arctic Circle. This plant is expected to be completed for operation in a year or two. It will be the largest Grondal plant in existence and one of the largest iron ore separating plants anywhere. In the beginning 1,200 tons of 35 per cent magnetite will be treated daily. The product will be exported to continental Europe.

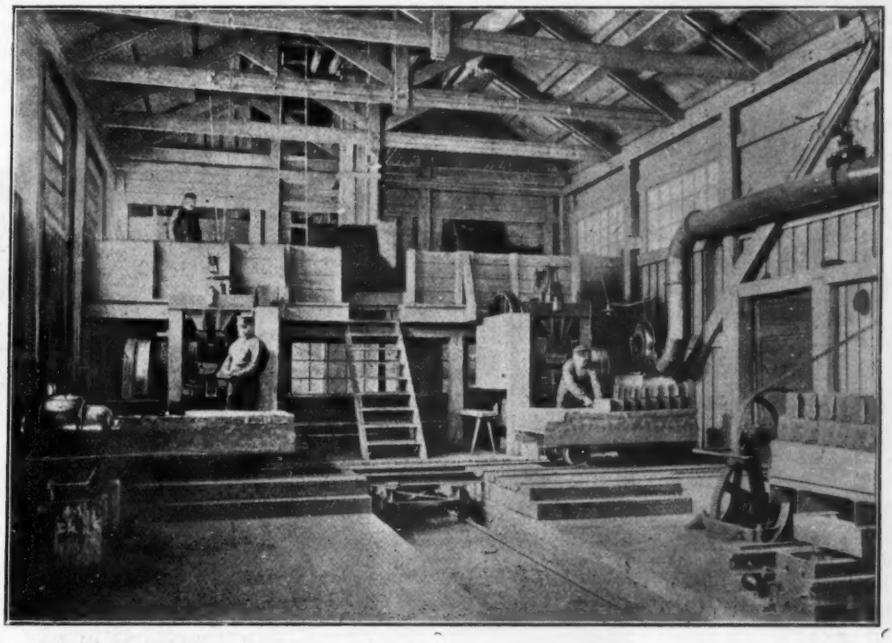


FIG. 7—BRIQUETTING PLANT AT HARRAVE, SWEDEN.

Location of Plant.

It must be admitted that generally it is to advantage to locate the separating plant close to the mine, as it is obviously an unnecessary expense to pay freight charges on the non-magnetic part of the ore, which is discarded as refuse at the concentration. In regard to the briquetting plant, the conditions are not so clear. At blast furnace plants, there is generally some gas to be spared which could be used to advantage in the briquetting plant, and it seems therefore that the best place for the briquetting plant ought to be there. The transportation of the wet concentrates ought not to cause any serious disadvantage except in the late fall when frosty nights might cause the concentrates to freeze to one solid mass in the cars. A little later they can be shipped in frozen masses which on arrival at the furnace are easily thawed out. The disadvantage, however, is the extra freight charge on the 6 to 10 per cent of water contained in the concentrates, which is avoided if the briquettes are burned at the mine. There is also less handling of goods when the wet concentrates are immediately transferred to the briquetting plant, making the process one continuous one, delivering the finished product direct to the railroad cars.

Advantages of Briquetting.

The chief purpose of the briquetting is the turning into hard and porous pieces a finely powdered iron ore, pyrites, residues, flue dust, etc. It is obvious that this not only facilitates the transportation and handling of the material, but is also of the greatest importance to the blast furnace. A great percentage of fines in the ore charge is liable to cause serious trouble in the smelting operation. The amount of flue dust is increased. In one furnace in the Northern States, which used fine concentrates, with about 25 per cent passing through 80 mesh, about ¼ of the ore charge was blown over to the dust catchers to be collected and recharged. The occurrence of explosions and slips is not unusual. The concentrates pack together in masses which, untouched in their centers, move downwards until they suddenly break open and the fine material quickly flows down into the zone of fusion before it has been completely deoxidized.

Another advantage of the briquetting process, nearly as important, is its desulphurizing quality. Lump ores, rich in iron and not containing lime, and with the sulphur mostly occurring as fissure fillings, can be sufficiently desulphurized through roasting in a vertical kiln. Such are, however, exceptions. Generally the highly sulphur ores are lean and up to this time have been lying idle, as it has been impossible to economically use them in blast furnace practice. Fine crushing and separation will usually turn a great part of the pyrites among the tailings or refuse. In case, however, the sulphur mineral is magnetic pyrites, this will follow the concentrates and an enrichment of it takes place. In such cases the Grondal briquetting has proved indispensible.

The following analyses giving the sulphur and iron content, etc., in the crude ore, concentrates and briquettes are very illustrative:

	Crude Ore			Concentrates		
	Fe per cent.	S per cent.	P per cent.	Fe per cent.	S per cent.	P per cent
1—Herrang	40.2	1.21	0.003	67.3	0.170	0.002
2—Flogberget	27.3	0.31	0.003	67.4	0.040	0.003
3—Strossa	46.8	0.030	0.015	69.2	0.015	0.003
4—Cwmavon (Pyrites Residues)	64.2	2.79	0.019	....	.....	.....

Recovery. per cent.	Briquettes Fe per cent.	S per cent.	P per cent.
1—92.9	65.5	0.003	0.002
2—82.7	65.3	0.007	0.003
3—95.4	67.1	0.005	0.003
4———	64.2	0.035	.....

It can be seen that only a trace of the sulphur is left in the briquettes. Sometimes it is found that when the percentage of lime in the ore is high, there is formed a sulphate of lime or gypsum which can not be decomposed by the heating process. A. Johnson has been experimenting with mixing a certain amount of high silicious hematite concentrates with the ore high in lime and has thereby been able to drive out the sulphur completely.

By the evaporation of the water in the concentrates (6 to 8 per cent) the briquettes become porous. The porosity generally amounts to 20 to 30 per cent of the volume. A briquette dipped into water will act like a sponge, drawing water upwards, and water poured on it will run right through. This is of considerable value in blast furnace practice, as it makes it possible for the gases to penetrate the briquette. There will be a correspondingly large surface for attacking, thus facilitating the reduction. Add to this the fact that the briquettes always consist of hematite, regardless of whether the ingoing goods are magnetite or not. Owing to the excess of air during the entire briquetting process, the magnetic oxide of iron is changed into a ferric oxide, which is far easier reduced than the lower grades of oxidation, especially by the CO gases in the upper part of the furnace.

This chemical change of the concentrates through the briquetting process must be considered as one of the most important advantages of the process peculiar to it and not found in other processes evolved for a similar purpose. In charcoal blast furnaces in the Swedish practice by using 50 per cent or more of briquettes in the charge, a saving of fuel has been obtained of 15 to 25 per cent per ton of pig iron produced, resulting in a very considerable reduction of production cost. In coke furnaces in Continental Europe the same experience has been gained. This is only to be expected, as in the blast furnace the changes in the ore generally take place in the upper part of the stack. Easily reduced ores are affected at 400 degrees Fahrenheit and the action becomes more rapid as the temperature rises. Through the loss of its oxygen, the ore is changed to a finely divided sponge of metallic particles which undergoes little change until it reaches the zone of fusion, where it is melted. Simultaneously with the reduction of the ore through the influence of CO, another reaction takes place which is of importance for the reduction, i. e., the decomposition of CO into CO_2 and carbon, which later is deposited as a fine dust all through the porous briquette and the metallic sponge resulting from it, serving among other purposes, that of removing the last traces of oxygen left by the incomplete action of the CO.

The use of briquettes in the Swedish practice has overcome the old superstition that a charge of more than 50 to 58 per cent of iron was not beneficial for the production of high-class iron. Now, even as high a percentage of iron in the charge as 65 to 69 per cent is used to advantage, making possible a greater output.

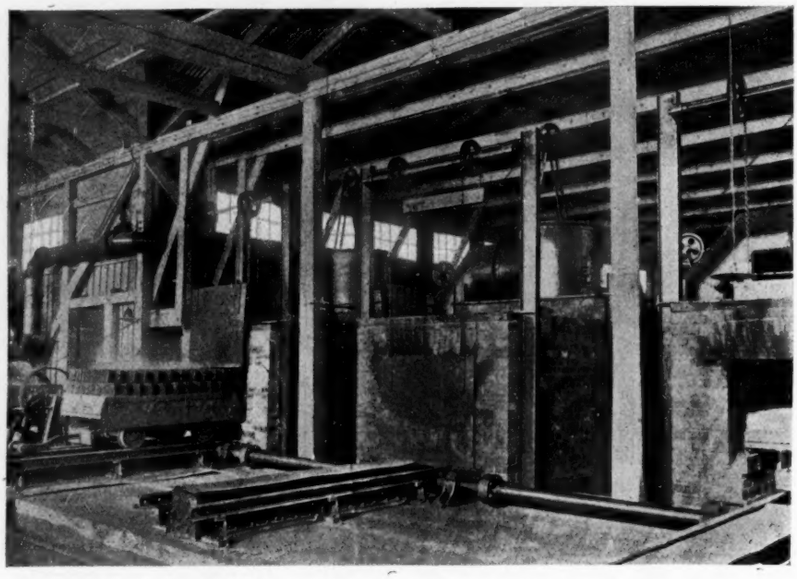


FIG. 8—TYPICAL INSTALLATION OF BRIQUETTING FURNACES.

A NEW ENGINEERING SOCIETY.

A number of Hungarian engineers and architects pursuing their professions in the United States, have organized the American Society of Hungarian Engineers and Architects, with the objects of bringing in closer touch engineers and architects of Hungarian extraction in the United States, and to encourage the exchange of engineering, technical and industrial information between the technical men of Hungary and the United States. The society will hold monthly meetings at which papers will be read and discussed. Electrical, civil and mechanical engineers, chemists, architects and craftsmen are included in the membership. The society is organized with the following officers: President, A. Henry Pilker, in charge of the transformer department, Crocker-Wheeler Co., Ampere, N. J.; vice president, Karoly Z. Horvay, chief draftsman, building bureau of board of education, Brooklyn, N. Y.; secretary, Zoltan de Nemeth, New York Edison Co.; treasurer, Sandor Oestereicher, New York Edison Co. The society's business address is Box 103, New York City.

The official statistics of the manufacturing activities of St. Louis during 1907, according to a statement made by the Missouri Manufacturers' Association, show a gain of $3,000,000 over the previous year. The report states that the official figures for the year just closed will be correspondingly satisfactory.

THE PRODUCTION OF MALLEABLE CASTINGS—XI

Various Methods of Cleaning and Inspection--- The Annealing Department Methods of Packing the Castings and Charging the Furnaces

By Richard Moldenke

A further word in regard to the inspection of castings in the hard. As the molds are dumped, and later on as the cleaning gang comes along, in large works at night, a rough separation of castings from the gates is undertaken. Cores are removed as much as possible, and in some cases with special core-rod pulling devices, for instance in the making of couplers or other long hollow work. Core rods, by the way, should be returned to the core room to wire straightening machines which operate better, cheaper and more effectively than the old hand straightening method. It even pays to put a pensioner watching the yard gates at straightening the nails used.

The rough sorting will take out all the mis-runs, castings where cores may have been forgotten and other defective work which may be easily seen even at night. All this goes with the sprues, in well regulated works, to the big slag barrel placed outside the buildings, and preferably run by a motor from the lighting circuit of the plant. The sprues should be rolled clean. There is a disadvantage in using sprues just as they come from the foundry. The metal is protected from the melting action of the flame in the furnace longer than it should be. Then more slag is made, which in turn makes the heat longer, more skimming must be done, and dirtier furnaces and dirtier iron are the consequence.

Cleaning Castings

The good castings, as far as these may be seen, now go to the hard rolling room, or tumbling room as it is oftentimes called, to be cleaned there. This room is usually the bane of the works. When one has say 60 of the rumblers usually employed in full blast, and no dust exhaust, one can neither hear nor see, the electric lights simply glow as if in the dim distance, and no one stays there longer than he can help. This, however, is the very reason why attention should be given the department.

To roll a casting longer than just enough to remove the sand by the hard stars placed in the barrels, and the contact of the castings with each other, is a waste of power and equipment. About 20 minutes seems to give good results under ordinary circumstances. However, at times the sand is so badly stuck to the castings, especially the heavy ones, that it practically forms an enamel on them. Rolling all day will only polish the work instead of cleaning it, and hence attention should be given the sand to see that it is free from too many fluxing impurities, and particularly the iron as it comes from the furnace, which may be badly oxidized through over-heating, or holding too long, getting "high."

The difficulty with sand burnt to the casting is usually seen when there is trouble with dull iron. A heat is sometimes kept in long after its proper time for tapping has passed, to get it hotter to pour well. This holding in the furnace allows the metal to slightly oxidize, the melting point is raised considerably, and while appearing extremely hot when tapped, the ladles "skull," and the castings are mis-run. Usually, in such cases, the sand trouble is noticed. The temperature of the metal was simply too high for the sand, and some of it fused to the casting. Considerable hand or air-chipping then becomes necessary for proper cleaning.

The hard rolling room crews must therefore be carefully watched to see that the charges of castings are removed when rolled sufficiently, and taken into the trimming room, where they are gotten ready for the anneal while being carefully inspected at the same time. The present practice of using exhaust tumbling barrels is doing much to make this department of the malleable works a habitable place, and incidentally cutting down the rolling cost. The stars placed in the barrels are made of the same metal as the regular castings, and the molding is generally part of an apprentice's work.

Pickling Castings.

From the nature of the metal in the hard, heavy castings cannot be rolled with very light and fragile ones without danger of breaking them. It is oftentimes necessary to separate large castings, in fact wedge them into the barrels with sticks of wood, so that they may not move, but allow the stars and other plain castings to tumble about them and thus do the cleaning. Light and fragile castings may not be rolled at all, but are pickled. This may be accomplished in two ways, with sulphuric or hydrofluoric acid, or by means of the sand blast. The advantages of the sulphuric acid pickling bath are its cheapness and ease of manipulation. Mixed about 30 to 1, or sometimes a little stronger, the light castings are preferably laid on a series of perforated inclined wooden shelves, and the fluid poured over the top. It trickles down over the castings on all the shelves, and runs back into the vat again. The night watchman, in going his rounds, or preferably the night annealer, keeps this up during the night, and next morning the castings are washed down with the hose, and go to the annealing room. Another method is to simply let the castings remain in the pickling vat, which may be heated by a steam jet, taking them out when clean. The disadvantage of the sulphuric acid pickling bath, is that it dissolves iron and not the sand adhering to it, so that it really makes the sand scale off. Further, it emits a bad odor. Where pickling is done for galvanizing purposes, a second bath of hydrochloric acid is sometimes provided after the sulphuric acid pickle, which cleans the iron still better and gives the zinc a good hold on the surface of the metal.

Use of Hydrofluoric Acid.

Hydrofluoric acid has the advantage of dissolving sand and not the iron. If heated, the pickle can be 1 to 50, and fine results are obtained. Like the sand blast, it shows up the surface imperfections very strongly, and has the disadvantage of being poisonous to a degree. It must be handled with rubber gloves when full strength, but is all right when diluted in the pickle. The author at one time used two large wood tanks with a lead steam siphon, so arranged that the liquor of the pickle could be forced from one tank into the other at will. Twenty-five tons of

small castings were pickled daily, and the cost was no greater than for rolling. Inconvenience of location caused the experiment to be stopped at the time, but one interesting feature was noticed. After washing the castings thoroughly, they would rust very quickly. In the meantime, the liquor siphoned into the other tank was cleaning the next day's batch of small castings. Now these rusty castings when duly annealed, would be dumped out of the pots without having the scale adhere to them, and most of them were shipped without being soft-rolled. They had a beautiful blue to black surface, and after chipping, grinding, or straightening, could go out thus with credit to the works.

Sand Blast.

The sand blast is just beginning to find its way into our foundries. In Europe, cleaning by this method is further advanced, notably in the stove shops. Nevertheless it is an excellent way of cleaning castings, and has come to stay. Rolling barrels can be arranged to have the sand forced into them while revolving, and if the castings can turn in all directions, they will be thoroughly cleaned.

When the castings come from the tumbling barrels, either by wheelbarrow or overhead trolley, they go to the trimming room tables where the sprues are chipped off with the hammer, they are sorted and gathered according to the shop orders on file there. This is one of the most important departments of the work. Not only can much subsequent grinding and chipping of the soft castings be done away with here by proper trimming off the comparatively easily broken hard metal, but the reputation of the works can be kept high or poor by the vigilance of the trimmers and inspectors. Any "jacking up" that may have to be done by the president of a concern when he finds complaints about the appearance of the work coming in, is done here, for the works management is apt to shut an eye to poor looking work, so long as the castings are sound. Furthermore, as all the castings are counted and weighed here, the discount is determined, subject to an addition before the finished castings leave the warehouse. From here the reports go to the shop office, and what goes into the anneal is known day by day in preparation of the shipments on orders.

Another good feature which should not be omitted in this department, is the gathering of the rejected castings into piles for the inspection of the molders during the noon hour. A man doing piece work has the right to see the castings he will not be paid for. Moreover, this gives an opportunity for the foreman to go over some of the molding problems with the men, as it is not a desirable thing to melt iron for scrap, nor to lose any more floor space for paying work than possible.

Annealing Department.

From the trimming room after inspection, the castings go to the annealing room. This department has its floor space divided into two portions, the packing floor, and the ovens. In the most advanced cases, where the ovens are dropped into the ground, and are practically soaking pits, a traveling crane doing the charging and discharging, the packing floor is at one end of the room, and the ovens proper at the other. In the older works, the ovens are usually in two rows, one on each side of the building, and the clear space between is used for the packing of the pots and manipulating the charging trucks, or else the ovens are on one side only and the other is used for the packing.

The floor of the annealing room, where the packing and trucking are done, is covered with 1-inch iron plates. These are cast as required, for the constant pounding on them, and the effect of the heat tends to warp them badly, as well as breaking many. A floor of this kind withstands exceptionally hard usage. The annealing boxes or pots, also called "saggers," are heavy containers, either square, round, or more usually oblong. When first cast, they are about one inch thick, with proper draft for the pattern. As they are used over and over again, if not broken the first time, being white iron, they become thinner through the scaling-off of oxidized metal, and finally becoming too thin, they are scrapped. These pots are piled three and four high, and placed on a stool of iron, so that when luted up with mud, and similarly covered with this material, (which is simply burnt sand from the rolling room mixed with water, and perhaps a dash of fire clay) or an iron plate, where particular care is to be taken, they make a more or less air tight receptacle for the castings packed in scale.

The scale used for the packing is more usually the cinder squeezed out of the muck balls where wrought iron is made. It is very rich iron slag, a silicate, with a lot of iron shot and small lumps in it. As this material is used over and over again, it becomes mixed with the flakes from the pots, (which is the best material for annealing purposes when properly crushed), and gradually the scale pile becomes a more or less rich oxide of iron. This was formerly sprinkled daily with a solution of sal-ammoniac to "rust" it, and thus a nice little pile of money was thrown away yearly. Cast or steel borings are also put into the scale, but if at all salable this process is a waste. The flakes from the pots, in all the older works, will be found to have made excellent roads around the premises, whereas the author, after purchasing the first batch of scale in the market, never bought any thereafter, the crushed flakes of the pots replenishing the supply, and necessitating an occasional screening to reject the fine powder, which through mixture with remaining sand on the castings burns on in the anneal.

Filling the Pots.

As the castings come into the annealing room, the operator places a pot on one of the stools, shovels in some scale, and lays the castings into this in regular order with scale to surround them, hammering the pot all the while to shake down the scale and tightly pack the castings. This to prevent warping as much as possible. The heavier classes of work are distributed in such a way that instead of bearing down on the smaller ones with their weight under the intense heat of the anneal, they rather support the whole structure. Many times, with flat work, it is not necessary to put scale between a batch of castings. Long flat castings are placed upright, to remove the tendency to bend, and oftentimes, with brake rods, it is neccessary to build up the boxes very high. The essential principles to observe are that no opportunity is given the mass to settle down and thus warp all the castings within the box, unless this settling is brought about by excessive heat ruinous to the castings, and to allow no chance for air currents to pass through the pots either through imperfect luting or settlement due to loose and careless packing. In the latter case, the work will be badly scaled away. Sharp corners will be rounded off to the disgust of the customer, or whole patches of the surface may lift off, and a very undesirable state of affairs will exist.

Scale.

This scale is, however, not the only

material for packing purposes. Hematite ore is much used, especially where cupola iron is the rule, and higher temperatures for annealing must be resorted to. More recently a very fine material has come in, and consists of magnetite from the Adirondack regions. This breaks in grains, and when sized to about a split pea, is just what is wanted for annealing work.

Intrinsically, however, sand and brick bats would answer for packing purposes, the real change in the castings being the conversion of the combined to an annealing carbon called "temper" carbon—by the late Prof. Ledebur, of Germany. This change is brought about when conditions are correct as required by the malleable process for the "black-heart" castings made in this country, and practically any kind of packing may be used to protect the castings from the burning of free gases and excessive heat.

Castings Packed in Fire Clay.

A number of tests on malleable castings annealed in the regular way and in fire clay, showed that when a packing is used that will not allow the carbon in the skin to migrate out and burn away—as it can in scale and ore—then the tensile strength of that casting is reduced by several thousand pounds per square inch. Hence it would not seem advisable to change from the ordinary method of work. When the skin was planed away, and the interior of these rather heavy test pieces subjected to the tensile test, the results practically agreed, and were not very much lower than the bars with the skin left on. This is stated here merely to off-set the claim occasionally made that the interior of a malleable casting might as well be thrown away as the skin is the only strong part of it. Evidently the authors of such statements must have had in hand test bars, the centers of which consisted of a succession of heavy shrinkages. Normally made malleable castings should not show this to so serious an extent.

Charging the Furnaces.

The pots duly packed and luted up, then covered with a coating of mud or an iron plate also luted tight, are now placed in the annealing ovens in regular rows with about four inches between them for proper circulation of the gases carrying the heat. The ovens are luted up and the firing commenced. This charging was formerly done entirely by hand operated trucks, the forks of the truck passing under the stool, and raising it by a lever arrangement. Then a gang of men got behind and the pot was rushed into the oven in its proper place.

THE UTILIZATION OF WASTE HEAT IN IRON WORKS

By John B. C. Kershaw.[1]

The subject of the more efficient utilization of the fuel used in iron and steel industries attracted considerable attention at the autumn meeting of the Iron and Steel Institute, two papers by Prof. Armstrong and Mr. Merz, respectively, being presented. Prof. Armstrong's paper, "The Control of Fuel Consumption," advocated co-operation between the ironworker and the chemist. Mr. Merz's paper, entitled, "The Effect of Power Supply Upon Industry," considered the utilization of the waste heat of coke ovens and blast furnaces by the generation of electricity. In this paper the author estimated that the waste gases of the coke ovens on the northeast coast would produce 250,000 horsepower when utilized in gas engines, while the waste gases from the blast furnaces in the Cleveland district would generate 61,000 horsepower, if utilized in a similar manner. Wymperis estimates that the power now wasted in the gases from all of the blast furnace and coke oven plants in Great Britain would give a total of 1,000,000 horsepower. A problem which calls for immediate solution is that of recovering and utilizing this waste heat.

The paper read by Mr. Merz showed that utilization is possible by generating electricity in connection with some large power undertaking. The first attempt at this was at Blaydon (in Durham) in 1905. Five other stations are now being built on a similar plan, three to operate on coke oven gas and one on blast furnace gas. A difficulty encountered in procuring expenditures to make use of these waste gases is the inability to find a market for the power that would be so obtained. It is also doubtful if the plan proposed by Mr. Merz, co-operation with the power companies would utilize more than 30,000 to 50,000 horsepower within ten years. It will be necessary to create a more general demand for electric power before the commercial demand for electricity generated from coke oven and blast furnace gas can be developed along practical lines. It is probable that a market for this power exists within the iron works themselves, and in this case the utilization of the 1,000,000 horsepower will proceed apace.

The writer will endeavor to show that such a market does exist at the present time for electric power. Metallurgists and engineers in other countries have already made use of it. The electric furnace for the manufacture of structural and special steels for the automobile and similar industries is not now in the experimental stage. At least 40 installations of this character are at present at work upon a commercial scale. Additional installations in considerable number are under course of construction, and will be in operation in 1909. The majority of these installations use the Girod, Heroult or Kjellin electric furnace, or one of their modifications. Several of the more progressive continental iron and steel works are now erecting or working these furnaces under license from the company controlling the patent rights. The greater number of these subsidiary installations are found in Germany and Austria, despite the fact that the original experimental work upon the application of the electric furnace to steel making was done in France, Sweden and Italy. Both German and Austrian iron masters are more progressive than their American and English competitors in the use of gas engines for power generation from waste gases and in the use of electric heat for the refining of steel. They seem to be ready at any moment to adopt new methods and machinery, when shown its economy and practical advantages.

That the electric furnace operates at less cost in certain lines is shown by the practice of the Bonner Fraser Fabrik, which manufactures light castings for gears and which has

[1]West Lancashire Laboratory, Waterloo, Liverpool, England.

adopted the Stassano electric furnace instead of crucibles. This was done solely to reduce the costs, and, at the same time, to improve the quality of the castings. A large electric fusion furnace of the Stassano type has replaced a battery of crucible furnaces. Power is applied to this installation from the generating station at Cologne at a cost of 4½ pfge. per kilowatt hour, equivalent to $9.75 per ton of 2,000 pounds of steel melted. The total cost of cast steel is about $31.50 per ton.

An installation of greater interest to American iron masters is that of the Forges d'Eich in Luxemburg, which utilizes electric power generated from blast furnace gas. This electricity is employed in a 200-horsepower Kjellin electric furnace of 1,100 pounds capacity. According to Greiner, the following are the details of the cost of operating this furnace, which uses a charge of cast iron, scrap, mill scale, lime and ferro-manganese:

	Francs.
Charge	41.
Electric current 1,115 kilowatt-hours at 0.005 frc.	5.5
Labor	8.
Total	54.5

This is equal to 120 francs ($24) per ton of 2,204 pounds. This is the maximum cost with a small installation and better results would have been obtained with a larger furnace, according to Greiner, even allowing the power cost to be double the amount estimated, or 0.01 franc per kilowatt hour.

Figures obtained by the Cockerill Co. in operating its power station for the last seven years shed considerable light on this question. The net cost was reduced to 0.65 centimes (1.3 cents) per kilowatt hour for the year 1906-07, during which gas only was employed. This compares with the cost of 8.8 centimes in 1900-1, when only steam power was available. The installation utilizes about 8,000 horsepower in its works, which it obtains entirely from coke oven and blast furnace gas.

That it is practical and economical to utilize the waste heat from coke ovens and blast furnaces in this manner is shown clearly by the above facts. The Cockerill Co. has replaced all its steam engines with gas engines, now generating 24,000,000 kilowatt hours per year from waste gases at a mean cost of 0.65 centime per kilowatt-hour, or about one-seventh of the lowest recorded costs with steam plants. An additional proof is the adoption by the alert managers of German and Austrian steel works of the electric furnace for the manufacture of structural steel and of special steels heretofore made in coke heated crucibles. There is also the example of the Forges d'Eich in Luxemburg, which shows how the two lines of development may be combined and electricity generated from waste gases and used in the same works for the manufacture of steel.

There is no doubt that the electric furnace is possible for the production of many varieties of steel. This is clearly proved by the fact that the larger part of the special steel used in the motor-car industry is made in the electric furnace and also by the repeat orders which the firm using the Rochling-Rodenhauser induction furnace at Volklingen, Germany, has received for steel rails from the Prussian government. These rails, which are made of electric steel, command a price of 30 marks ($7.15) per ton higher than the Thomes rails made by the same firm.

Steel for rails and structural purposes is produced in many of the larger iron works of Great Britain, and there seems to be no reason why electric steel should not be added to the list. The motor-car industry has developed rapidly, but the bulk of the special steels used in England is still imported from France. It would be the part of wisdom for the managers of the iron smelting works to recognize the opportunity which is placed before them and to utilize the blast furnace and coke oven gas now going to waste in this new branch of electric metallurgy.

THE SEVENTH INTERNATIONAL CONGRESS OF CHEMISTS.

The seventh International Congress of Applied Chemistry, which will be held in London from May 27 to June 2, will, it is believed, prove a notable and record gathering. His Majesty, Edward VII, has given his patronage to the congress, while the Prince of Wales is expected to open the congress at South Kensington, and to deliver an address of welcome to the delegates gathered from practically every civilized country of the world.

Since the first congress was held in Brussels in the year 1894, the gathering has grown rapidly in magnitude and importance, and at Berlin in 1903 and again at Rome in 1906, over 2,000 chemists attended the congress and joined in its proceedings. It is expected that this number will be largely exceeded at the London gathering, and that a total membership of 3,000 will be attained.

The work of the congress is now carried on in 17 sections and subsections, each provided with its own staff of honorary officers; the official languages of the congress are four, viz.: French, German, English and Italian, and even these do not always suffice for the discussions.

Sir Henry Roscoe has consented to be honorary president of the London congress, while Sir William Ramsay will be acting president, and undertake the more arduous duties of the post.

The following are the officers of the sections in which THE IRON TRADE REVIEW readers may be supposed to be specially interested:

SECTION.	PRESIDENT.	VICE PRESIDENT.	HON. SECRETARY.
1. Analytical chemistry	Dr. T. E. Thorpe	Sir W. Crookes	A. C. Chapman
2. Inorganic chemistry	Dr. Ludwig Mond	Sir J. Dewar	Dr. E. F. Armstrong
3. (a) Metallurgy and mining	Sir Hugh Bell	Prof. Henry Louis	D. A. Louis
(b) Explosives	Sir A. Noble	Capt. T. G. Tulloch	J. E. Petavel
4. (a) Organic chemistry	Prof. W. H. Perkin	Prof. F. S. Kipping	Dr. G. T. Morgan
11. Law, political economics and legislation with reference to chemical industries.	Hon. Lord Alverstone	Hon. Sir J. Fletcher-Moulton	Hon. Viscount Tiverton

A journal will be published daily during the meeting of the congress, giving: 1. The program for the day. 2. A short summary of the papers read and discussions of the previous day. 3. A list of visitors with their local addresses. The full official report of all the papers and discussions is published about a year after the close of the congress, and is now a most important and voluminous publication. The report of the Berlin congress comprises 4 volumes of 1,000 pages each, while that of the Rome congress is nearly as bulky and extensive.

Special lectures and addresses are also arranged during the congress week at which all the sections combine, and for the London meeting, Prof. Haller, of Paris, Prof. Otto de Witt, of Berlin, Prof. Paterno, of Rome, and Sir Boverton Redwood, of London, have been asked and have consented to deliver lectures upon the subjects of which they have made a special study.

AN INTERNALLY-FIRED HELICAL FURNACE FOR ANNEALING.

By C. M. Ripley.

Much annealing and hardening is done in the ordinary type of stationary furnaces, and owing to the size and shape of much of the material it must continue in that way, whatever the inconvenience and expense. Where size and shape have permitted, some work has been and is being done in rotating cylinders heated from the exterior. Such cylinders are generally made of cast iron, and it is obvious that the life of the iron is too short to be satisfactory for many purposes especially for the heating of steel. It is also obvious that the cylinder cannot conduct the heat to the material as economically as a direct application Tumbling barrel funraces and bucket and chain conveyor furnaces have been used for certain low-temperature work, each kind having its limits as to durability and efficiency.

In this country alone there are vast quantities of small parts, of equal size, of material in brass, copper, steel, aluminum, gold, silver and other metal which must be annealed or hardened every day such as cartridge shells, ferrules, eyelets, buttons, caps, cups, coin blanks, steel balls, saw teeth, tacks, screws, rivets, rings, springs, nuts, punchings, etc., and the internally fired helical furnace here described and illustrated has been designed to heat these pieces uniformly and by wholesale.

The furnace is formed of a steel cylinder, with a smooth fire tile lining of helical form. It is rotated upon roller supported by a suitable frame. Ordinarily the speed is from one to three revolutions per minute and the time of travel of a piece through the furnace from 3 to 10 minutes. Either oil or gas may be used as fuel, which is injected directly into the chamber in the opposite direction to that of the travel of the material. Combustion is complete, and the spent gases find vent where the material enters—giving up their heat to the incoming material as they pass, the material thereby being heated up in a gradual manner.

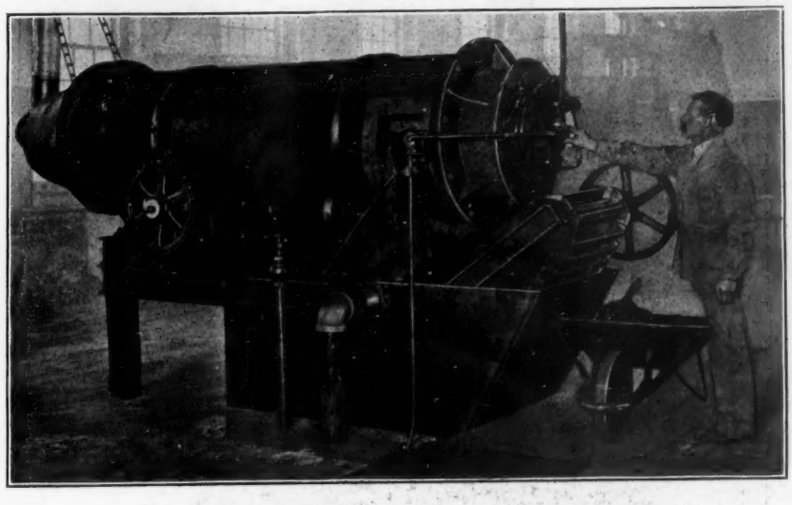


Fig. 1—Internally-Fired Helical Heating Furnace.

The material is charged into the feed-drum in bulk and is then wormed through the furnace at a uniform and positive speed. The time and temperature for every piece is absolute. Starting cold, the material winds its way through the convolutions of the furnace for a distance of about 47 feet, tumbling over itself, constantly coming in contact with a new hot surface, always in the direct heat, but only reaching its ultimate heat at the point of discharge, where a pyrometer is so located as to show exactly what that ultimate heat is. Heating in this manner steel to be hardened, enters the bath at its rising hardening temperature. This action is important, also, in preventing or reducing oxidation.

Each piece is heated to exactly the same temperature. As an instance of the performance of the furnace, a lot of 15,732 pieces of steel was run through one of the furnaces, and hardened in oil. Each piece was then carefully tested. Only two were found imperfect, and they from flaws in the steel itself, not from the heat treatment. The manufacturer stated that such runs were the rule, not the exception. Again, material annealed in this type of furnace in 6½ minutes was found to be cleaner and better in every way than the same material annealed for 45 minutes in a tumbling barrel type of furnace. This would indicate that protection from oxidation and a saving of time are both effected when the material is heated up gradually, never overheated and discharged the moment it has reached its ultimate temperature.

When the furnace was used for hardening a quenching tank with a conveyor was provided below the discharge spout so that the material after immersion was automatically removed from the bath quite clean and delivered into a truck or wheelbarrow. Provision was made so that two kinds of material could not become mixed; nor could any lodge in any part of the furnace or bath. By the removal of two bolts the conveyor could be easily removed from the bath, giving free access to every part for cleaning or other purpose.

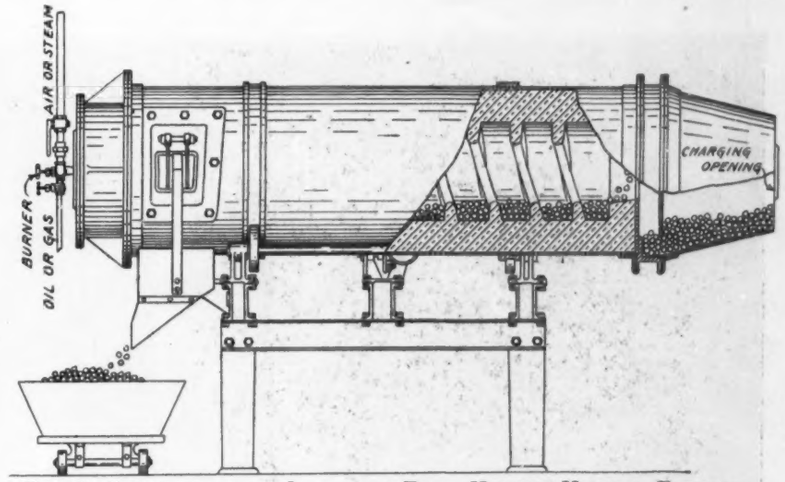


Fig. 2—Construction of Internally-Fired Helical Heating Furnace.

The furnace requires no chimney. A hood to carry off fumes from the oil bath or from machine oil on the

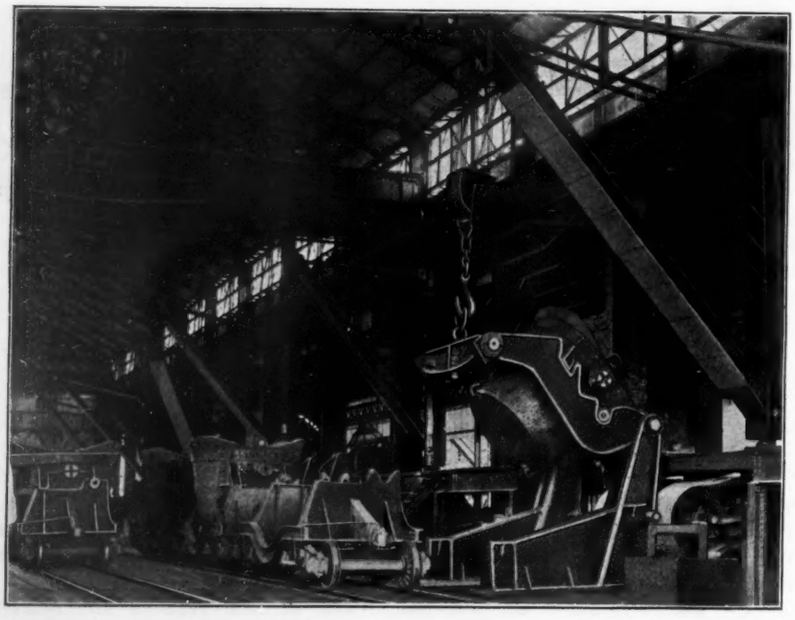
material is sometimes desirable. Either air or dry steam may be used to inject the oil or gas fuel. Coal or coke fuel cannot be used.

One of the chief features of the internally fired helical furnace is its durability. Practically all the iron work is out of range of the fire, and all parts are simple and strong. This furnace is manufactured by the W. S. Rockwell Co., 50 Church Street, New York.

The Columbia Boiler Works, Columbia, Pa., advises respecting the damage done by a recent fire that it will only have to place a new roof on the main building. The machinery has been saved from damage.

PIG CASTING PLANT AT GARY.

Since the publication of the article describing the pig casting plant at Gary in the issue of Jan. 7, an illustration has come to hand which indicates unusually well the advantages of the unique arrangement devised for that plant. The accompanying view shows one of the ladles in the pouring cradle in process of pouring. The ladle has been picked up from the car standing in front of the tilt and set on the cradle by the traveling crane. The pouring is then accomplished through the agency of the wall crane, as shown. As will be noted, the boom of the crane is faced with asbestos to protect it from the heat of the iron.



Ladle Tilting Cradle for Pig Casting Plant at Gary.

A NEW METHOD OF CUTTING OUT METAL SHEETS.

We illustrate herewith a machine specially constructed to cut metal sheets into any desired shape, as templates, sweepboards for foundries and all kinds of curved shapes required in every day shop practice. It is not a machine for repetition work, such work being more suitably done by means of special dies and punches, but it is essentially a machine to replace the hammer and chisel work, which, up to now, has been necessary when only one or two pieces of a similar shape have been required.

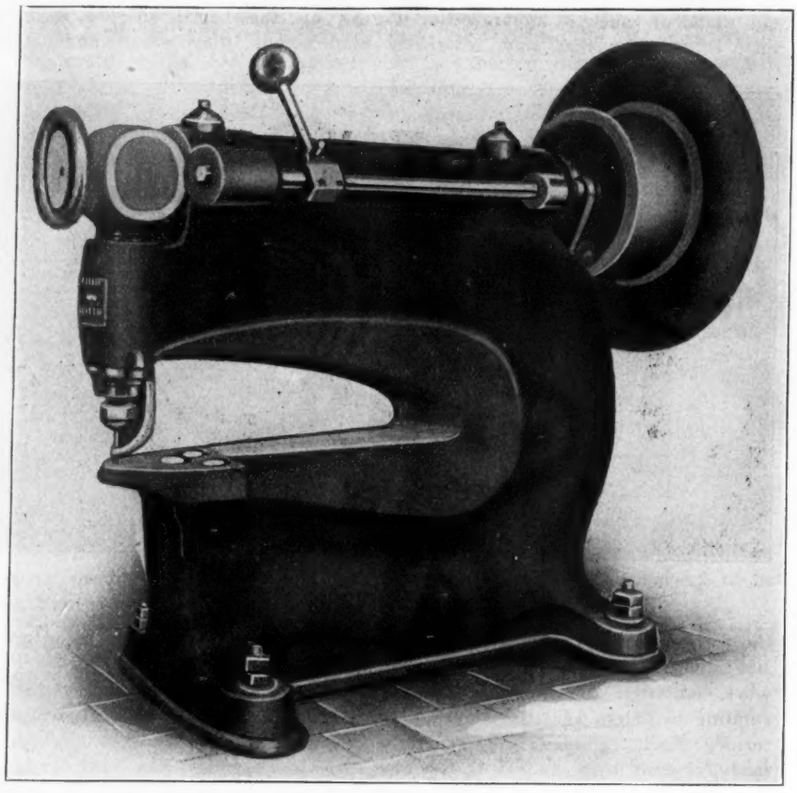


Fig. 1—Punch for Shaping Out Irregular Outlines.

The machine is made in two sizes: No. 1 with a gap of 12 inches is suitable for plates up to ⅛ inch thick, and No. 2, with a gap of 24 inches, suitable for plates up to ¼ inch thick. It runs at a speed of 300 revolutions per minute for the No. 1 machine and 250 for the No. 2. There is furnished a punch of a special shape as shown in the sketch, Fig. 2. The cutting edge of the tool is in front and the back of the

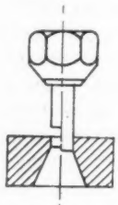


Fig. 2—Detail of Punch.

punch is prolonged to act as a stay. The cutting edge can be set in any direction to suit the work.

The stroke of the machine is slightly greater than the thickness of the piece to be cut and the movement is obtained by a special eccentric motion as shown in Fig. 3, the whole arrangement being of a circular construction.

The tail of the punch works in a die which is placed in the anvil of the machine just below the punch and the tail of the latter is long enough to work up and down in this die throughout the stroke so that it affords an efficient stay for the punch. The die can be raised and lowered by means of a screw to enable the operator to pass a sheet of metal under the punch, and thus begin cutting in a hole in the middle of the plate.

This punch is quick acting, and the chips produced are of the crescent shape shown in Fig. 4. The groove left

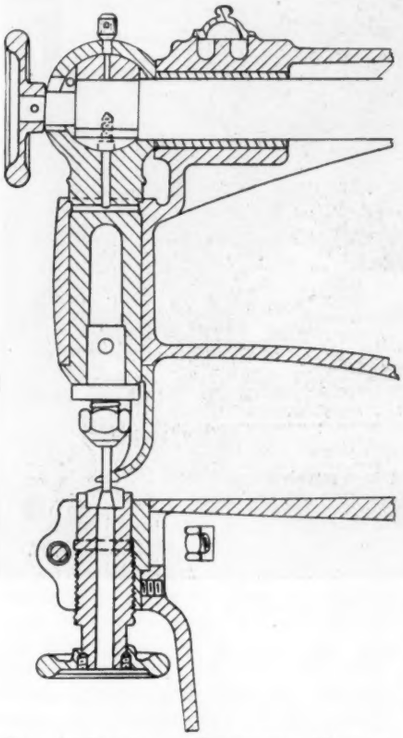


FIG. 3—DETAIL OF PUNCHING MECHANISM.

by the punch acts as a guide and the operator has simply to place the plate under the punch and turn it slightly in pushing to obtain any desired shape. After a few minutes practice, a boy can cut out on this machine to mark, any shape, so closely that a smooth file will finish the work.

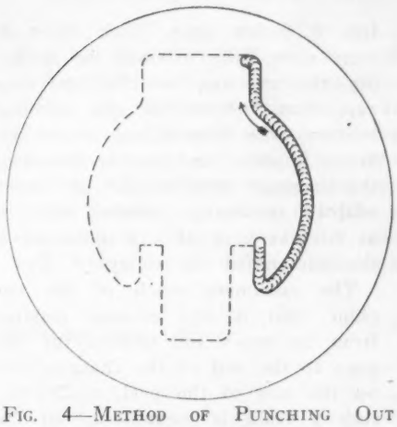


FIG. 4—METHOD OF PUNCHING OUT IRREGULAR SHAPES.

This machine is made by the Societe Anonyme des Establissements Ph. Bonvillain & E. Ronceray, 9 and 11 rue des Envierges, 17 and 19 Villa Faucheur, Paris.

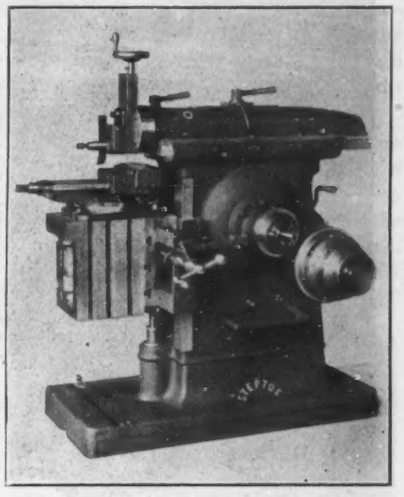
A NEW CRANK SHAPER.

The accompanying illustration shows a 16-inch, back geared, crank shaper, which has recently been designed by the John Steptoe Shaper Co., Cincinnati. Some new features have been incorporated in this machine which make for convenience of operation and extend the range of work. The head can be loosened and swiveled to any angle, by means of the lever at the back of the head and instantly fastened by means of the same lever. A stud passes through the center of the harp and an eccentric stud from the top of the ram pulls the head squarely against the head of the ram. By the use of this device, all bolts for fastening the head are eliminated. The length of stroke is adjusted by means of a crank fitted to a rod projecting through the feed plate. This adjustment can be made while the machine is in motion. The device in the bull gear is self-locking, and is held firmly in position as soon as the adjusting lever is taken from the shaft.

The feed plate is considerably different from any design heretofore used. The feed eccentric is pivoted, so that it can be swiveled in any direction, and is provided with holes drilled in the plate and taper reamed. The stud in the eccentric has a spring in it and is also tapered. The tapered pin thereby takes up any wear which may occur in the hole. The holes are drilled in a circle, so that they are kept as far apart as possible. They are drilled and numbered in accordance with the teeth in the feed ratchet, which facilitates the securing of any desired feed. The ring, which encircles the feed eccentric, is split and fitted with a fiber washer for the taking up of wear, which is accomplished by filing off the washer.

The vise base is graduated at an angle, so that the graduations are always visible to the operator. The upper jaw of the vise is fastened to the lower jaw, by means of the two bolts through the upper jaw, thus avoiding any possibility of the work being raised while the vise is tightened.

The shaft bearings are provided with cast iron bushings pressed into place and provided with ring oilers. The rings are flat in cross section, giving liberal contact on the shaft and distributing oil freely. The back gears comprise a sleeve to which two gears are attached. The sleeve gears are splined to the shaft and, therefore, constantly run with it and avoid any wear on the hole in the gears, due to slippage on the shaft. By means of a second sleeve, these gears are moved at the will of the operator,



STEPTOE 16-INCH CRANK SHAPER.

who uses a lever at the back of the column, which is placed in an upright position within easy reach. The driving gears are a high grade of phosphor bronze. The shaper has a single gear ratio of 6¾ : 1 and a back gear ratio of 20 : 1.

The Acme Machine Tool Co., Cincinnati, O., is getting under way rapidly. Most of the equipment has been purchased. James R. Pearson as vice president will have charge of the mechanical part of the business. Mr. Pearson was with Warner & Swasey, Cleveland, for about 15 years. J. H. Williams will be the business manager. The company will make a complete line of turret machinery, including screw machines and brass working lathes.

AN ALLIANCE OPEN-HEARTH CHARGING MACHINE FOR THE PITTSBURG STEEL CO.

The Alliance Machine Co., Alliance, O., has installed in the open-hearth department of the Pittsburg Steel Co., Monessen, Pa., two floor type charging machines of unusual construction and dimensions. The accompanying illustration shows the general features of the machine, which is of all-steel construction, and also its relation to the furnaces and charging floor.

It will be noted that the girders forming the bridge of the machine are well above the charging floor, so that the machine may pass over the various articles which are usually found on the charging floor; in fact, it will pass over a barrow of the usual construction found in open-hearth plants.

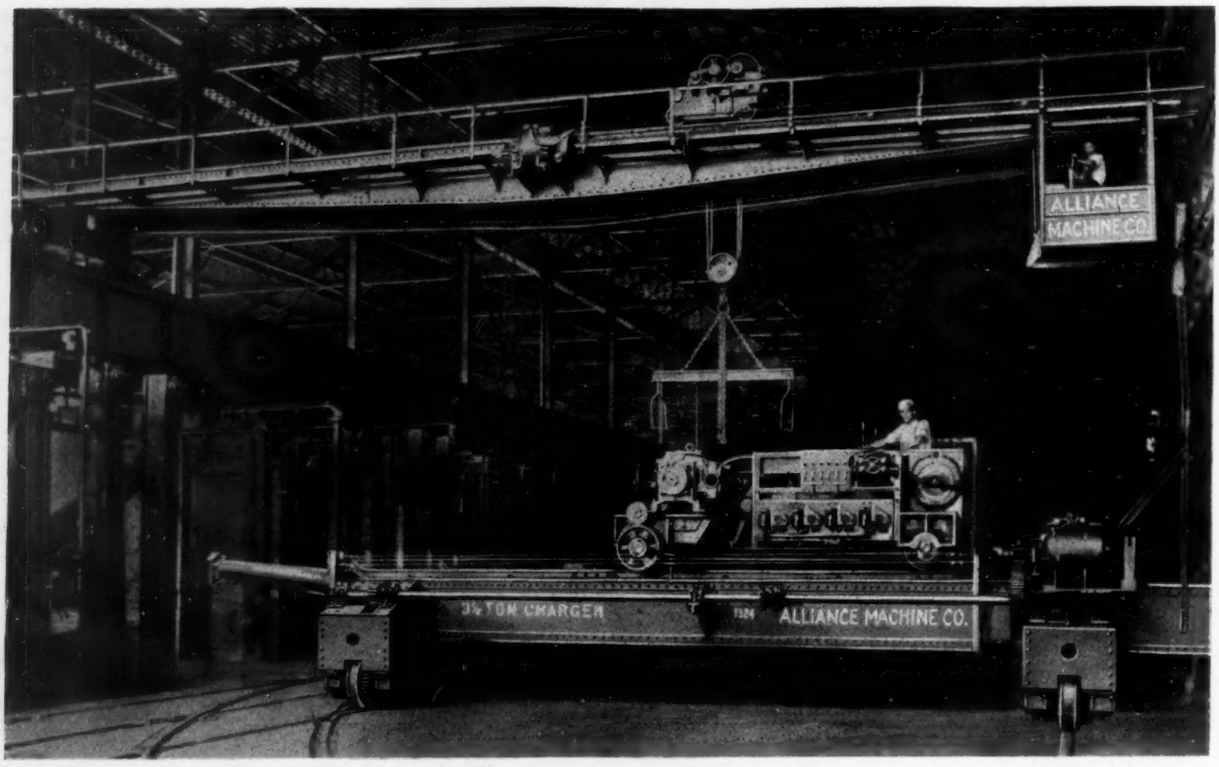
Owing to the great size of the furnaces, the distance between the furnace walls being 16 feet and also on account of the fact that a clear space of 9 feet 10½ inches must be left in front of the furnaces, it was necessary to design the machine not only with great reach, but also with a maximum possible carriage travel which could be secured on a bridge of 24 feet 6 inches span. Both these objects were fully attained by designing the machine so that the four supporting wheels of the carriage run on rails located on top of the bridge girders, and further providing the carriage with a pair of wheels adapted to engage inverted rails so as to take care of any up-thrust at the rear end of the trolley.

The maximum reach of the machine, that is, the greatest distance from the track rail nearest the furnace to the end of the charging box on the end of the peel, is 28 feet; such a reach is exceptional, but owing to the massive construction throughout, no trouble whatever has been experienced, even when pushing a long line of loaded charging buggies with the end of peel. The carriage travel is 19 feet 1 inch. The machine is designed to handle a 7-foot charging box.

The girders and end carriages are built up of structural shapes, and strongly reinforced, braced and framed together to meet the severe racking strains to which charging machines are necessarily subjected. The trolley is constructed entirely of steel castings, and is designed so as to have all working parts easy of access. The shaft bearings are all provided with tongued and grooved caps, and the operator is so located as to have an unobstructed view of his work.

Both the bridge and trolley wheels are keyed to their axles and run in bearings similar to the M.C.B. type, equipped with boxes for holding oil and waste. The bridge is operated by two 30-horsepower motors, one being mounted on each side of the bridge, thus requiring two bridge line shafts, and positively driving all four bridge track wheels, thus providing the best possible conditions for a machine which is frequently called upon to act the part of a locomotive in pushing a line of loaded charging buggies.

The speeds are as follows: Hoisting, 60 feet per minute; carriage travel, 200 feet per minute; bridge travel, 250 feet per minute; the charging box is rotated at a speed of 35 revolutions per minute.



ALLIANCE FLOOR TYPE CHARGING MACHINE AT PLANT OF PITTSBURG STEEL CO.

The Republic-Connellsville Coke Co., capitalized at $2,500,000, and with headquarters at Pittsburg, has been formed by the consolidation of the Republic Coke Co. and the River Coal Co. Both of these companies owned extensive holdings in Fayette county, Pa., and were controlled by H. C. Frick Coke Co. interests. Thomas Lynch has been president of both companies.

OIL HEATING FURNACE AND STEAM HAMMER FOUNDATION AT THE NEW PLANT OF THE WESTERMAN IRON WORKS, SEATTLE.

In its new plant, 17-35 West Lander street, Seattle, Wash., the Westerman Iron Works has built an oil heating furnace of original design and has installed a 6,000-pound Bement steam hammer in a place where a short time ago was nothing but treacherous tidal mud and river silt giving little promise of anything approaching a solid foundation.

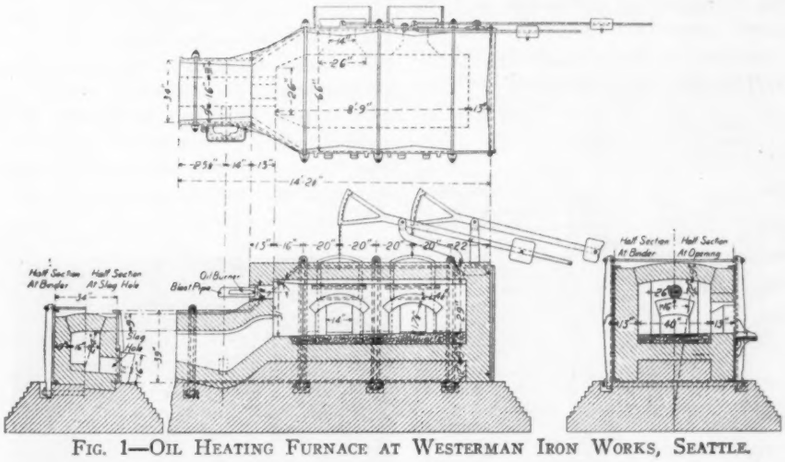


FIG. 1—OIL HEATING FURNACE AT WESTERMAN IRON WORKS, SEATTLE.

The furnace, which is shown in Fig. 1, is built under the patents of Stephen Uren and has three distinctive features. The first and most important of these is that the fuel oil inlet is placed at the same end of the furnace as is the waste gas flue leading to the chimney, instead of at the opposite end, as is customary. Also the furnace is made unusually high for its size and the flue, immediately after leaving the furnace, tilts downward at an angle of about 40 degrees from the horizontal. At the bottom of this incline is situated the slag hole.

The furnace at the Westerman Iron Works is used entirely for heating billets which are to be forged under the steam hammer. The furnace is 8 feet, 9 inches long inside, 4 feet wide and 29 inches high from the floor to the crown of the arch. It is built entirely of fire brick resting on a solid red brick foundation. The end walls are 13 inches thick, the roof and floor are 9 inches thick, as are the walls of the flue. The floor is paved with quartz, 6 inches thick at the outer end tapering to 4 inches at the flue end, giving the floor a tilt of 0.2285 inch per foot toward the flue, so that the slag will run off and collect in the slag pocket.

The oil burning nozzle is led in through a 7½-inch square opening situated directly over the flue. The burning oil projects along the top of the furnace, spreading out like a fan until it reaches the outer end wall where it is deflected through 180 degrees and passes back along the floor to the flue. The oil is atomized by steam when starting but after it is burning well the air blast, which enters through a 5-inch pipe surrounding the oil pipe, is turned on and the steam is shut off.

The furnace, as built, is fitted with only one door of sufficient size to take billets up to 20 inches square. Two hours are required to heat a 20-inch billet to a welding temperature and a little less than one hour is required for a 12-inch billet. When operating continuously the furnace consumes about 10 barrels or 420 gallons of crude oil per 10-hour day. The cost of fuel for operating the furnace is therefore $12.50 per day in Seattle.

The 6,000-pound steam hammer was built by the Niles-Bement-Pond Co., and installed by the Hallidie Machinery Co., Seattle. The interesting feature of this hammer is its foundation. The location of the works is on the west side of the Duwamish river delta at the south end of Elliott bay, Seattle. The natural ground is soft sand and mud varying from 12 to 24 feet in thickness, underlaid with blue clay and hardpan. The natural surface is exposed at low tide and is covered with from 5 to 7 feet of water at high tide. Sand dredged from the bottom of the bay was filled in until the street grade, about 7 feet above high tide, was reached; the total height of this sand fill is 14 feet.

To secure an adequate foundation for the anvil a hole 16 feet long, 6 feet wide and 8 feet 10 inches deep was excavated in the sand fill at the point where the hammer is located. Forty-two fir piles from 30 to 35 feet long were driven in this hole and cut off flush with the bottom of the excavation. The piles were set as close together as possible, forming practically a solid mass. They were all driven to "a refusal of penetration"

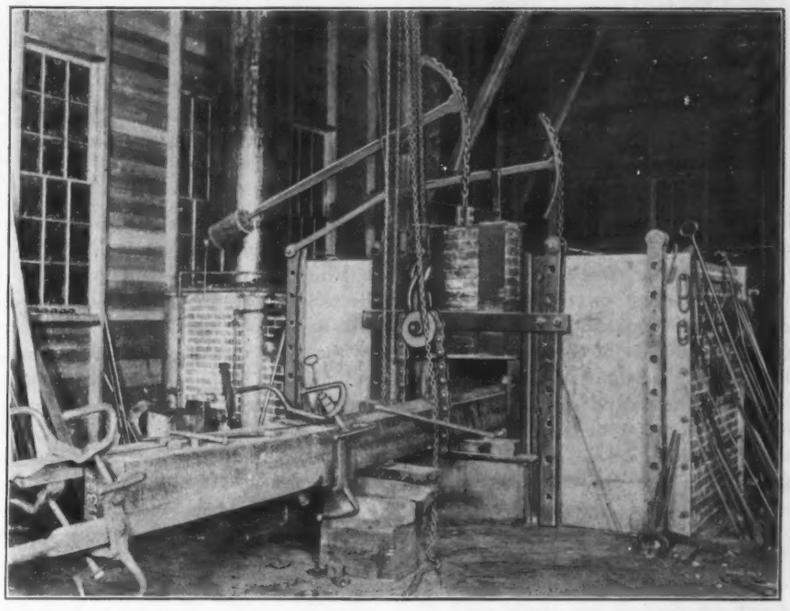


FIG. 2—OIL HEATING FURNACE AT WESTERMAN IRON WORKS, SEATTLE.

or until a 3,000-pound pile driver hammer dropped 20 feet caused no perceptible sinking. On this floor of piles a grill work 12 by 12-inch timbers firmly spiked together was built. The grillwork is 5 feet in thickness. The anvil block of the hammer rests on its upper face. The hammer strikes a blow of 120 tons, which this pile and timber foundation set in filled ground and river silt resists perfectly. The foundation has been in service for three months without perceptible settling. The frame of the hammer is set on concrete piers in the usual manner.

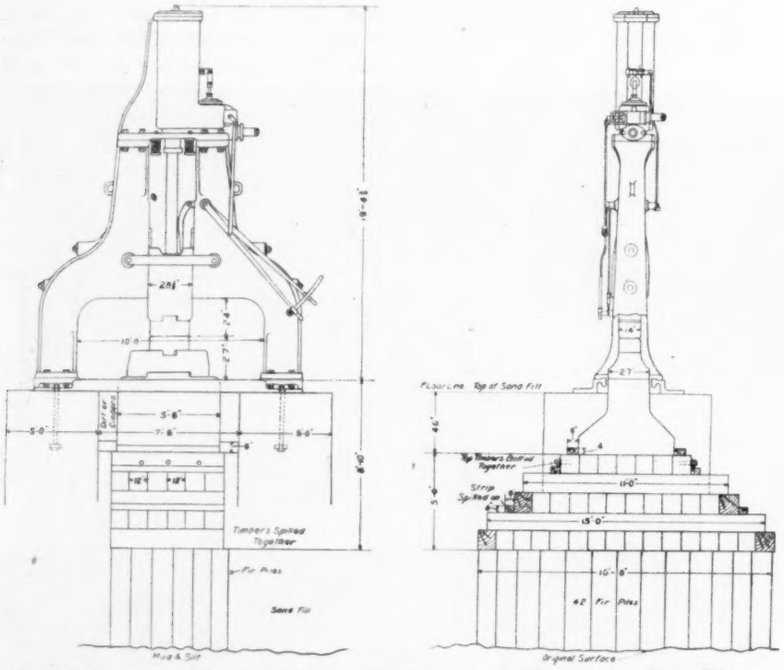


FIG. 3—DETAILS OF STEAM HAMMER FOUNDATION AT WESTERMAN IRON WORKS, SEATTLE.

The hammer itself is interesting. It is the largest on the north Pacific coast. It weighs complete 90,000 pounds and cost $6,600 in Seattle. It has a total height of 19 feet, 4¾ inches. The cylinder is 20 inches in diameter by 5 foot stroke, and uses steam at 100 pounds per square inch pressure. The hammer and furnace are served by a 20-ton jib crane.

Monthly Meeting of the A. S. M. E.—The next monthly meeting of the American Society of Mechanical Engineers will be held on Feb. 23, the fourth Tuesday of the month, instead of the second Tuesday as usual. The subject of the evening's discussion will be Safety Valves, introduced by a brief paper by Frederic M. Whyte, general mechanical engineer of the New York Central lines.

BOOK REVIEWS.

Foundry Practice. By James M. Tate and Melvin O. Stone. Third edition revised. New York. John Wiley & Sons. 5 x 7½ inches. 234 pages. Cloth. Supplied by THE IRON TRADE REVIEW for $2.00.

This little book was originally written as a text book for use of the students at the University of Minnesota, and is designed especially to fill the needs of the beginner in foundry work, rather than those of the experienced molder. The work comprises 13 chapters and takes up foundry problems in the order in which they are usually presented to the student or apprentice. Green sand and dry sand molding are considered in the first two chapters, which show the methods of making molds from the simpler types of patterns, and discusses the necessity of venting, drying, etc. The third chapter illustrates and describes the use of the various molders' tools and equipment, including the flask, soldier, chaplets, cores, etc. Chapter IV discusses cores and the method of making them. The construction and operation of the cupola and air furnace is taken up in chapter V, while chapter VI discusses chilled castings and chapter VII malleable castings. Steel castings are the subject of a separate chapter, in which the sand mixture, mold, mixtures of metal, melting and converting are all discussed. The same applies to brass founding. Cleaning castings and compressed air for foundry purposes are presented in two separate chapters, while chapter XII entitled "Cast Iron Alloys" comprises a series of tables for foundry use, showing the composition of various iron mixtures. A feature of the book of no little value is the glossary of foundry terms.

Machine Shop Calculations. By Fred H. Colvin. New York. Hill Publishing Co. 5 x 7 inches. 174 pages, illustrated. Cloth. Supplied by THE IRON TRADE REVIEW for $1.00.

This handy little book is designed for the instruction of workers in the machine shop in the more elementary calculations which are required of them from day to day. The language is extremely simple and the illustrations used are drawn from the problems which arise in every shop. The book comprises 20 chapters, the first five of which are devoted to the subjects found in school arithmetics, such as fractions, decimals, percentage, etc. The remaining chapters show how these principles of arithmetic are applied in the shop in the figuring of speeds of pulleys and gearing, determination of gearing for thread cutting in the lathe, for screw thread calculations, taper work, etc. Other chapters take up figuring the cutting speed of lathes and other tools, square root, the measurement of surfaces, the determination of volumes, the measurement of angles and the making and using of formulas. Chapter XVIII is devoted to the vernier and micrometer, and explains simply and clearly the use and reading of these familiar instruments. Chapter XIX discusses regular polygons and their properties, while the final chapter is entitled "The Uses of Shop 'Trig'".

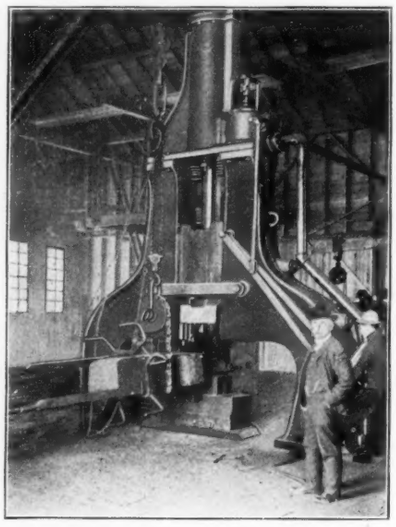


FIG. 4—6,000-POUND STEAM HAMMER MOUNTED ON PILE FOUNDATION.

Year's Price Changes Small.

In the four days of active trading last week, the American stock exchanges being closed on Friday, Lincoln's birthday, and the day following, there was little opportunity for changes. The general tendency in prices however, was slightly upward. Since Jan. 2, when this year's highest price was reached by 20 active railroad stocks, the extreme fluctuation in the average prices has been 3.04 points, or between 116.93 and 119.97. The fluctuation has been even less in 12 active industrial stocks, which reached the high point of the year Jan. 7, it having been confined to a range of 2.84 points, with 84.09 for the low and 86.95 for the high. The present prices are still almost equally distant from the extremes named.

Monday was one of the dullest days of the year, but prices were firm, averaging higher. May wheat in Chicago reached a new high price on the present movement. An advance of a few stocks Tuesday still left the market as a whole dull. London made its first important buying of the year in 25,000 shares in New York on balance. The tone of the market was firm Wednesday, with prices averaging high, but no increase in volume of trade. British consols were 9/16 higher, and London continued to buy American securities. The Copper Producers' Association made its first report, estimating the stocks of marketable copper in the United States Jan. 1 at 122,357,366 pounds. While the market was dull Thursday, yet prices were firm and averaged higher. London again made a moderate purchase of American securities, and English consols again advanced to 85, the highest price for months. On Friday, while the exchanges were closed, the New York public service commission granted the Erie Railroad Co. permission to issue $30,000,000 in bonds, hedged about with 10 restrictions. The strongest group of stocks for the week was the coppers.

The call loan market was quiet, the rates ranging between 2 and 2¾. Time money was dull and easy. A further decline of 10,000 in the number of idle cars reduced the total of sidetracked equipment since Jan. 6 by 32,000 cars, this being regarded as a favorable sign. The weekly bank statement in actual figures showed surplus increased $295,925; loans decreased $8,352,500; deposits decreased $11,900,900, and the ratio of reserve 25.8, an increase of 0.1. State banks and trust companies report loans increased $23,040,100; net deposits increased $25,595,600, and the percentage of reserve 18.1, a decrease of 1.0. Shares were sold to the number of 1,496,239, compared with 2,578,649 the preceding week and 3,201,400 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $23,030,000, compared with $32,564,000 the preceding week and $8,395,000 the corresponding week last year.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. Feb. 13	Changes in Week	Date 1909 Ann. M't'g.	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	15	+ ⅛	Sept. 2	$19,820,000		.....	.....
Allis-Chalmers pr	48½	+1¾		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	8⅜	+ ⅛	Feb. 2	41,233,300		.....	.....
Am. Can pr	75¼	+ ¼		41,233,300	7 cum	1¼ Q.	Jan., 1909
Am. Car & Foundry	50½	.....	June 24	30,000,000		½ Q.	Jan., 1909
Am. Car & Fdy pr	111	.....		30,000,000	7 n. c.	1¾ Q.	Jan., 1909
American Loc	55⅝	— ⅜	Oct. 19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc. pr	112	— ¼		25,000,000	7 cum	1¾ Q.	Jan., 1909
American Ship	58	.....	Oct. 13	7,600,000	4	1 Q.	June, 1908
American Ship pr	104⅛	.....		7,900,000	7 n. c.	1¾ Q.	Oct., 1908
Am. Steel Foundries (new)	36	.....	Dec. 2	17,184,000		.....	.....
Am. Steel Foundries, pr	47½	.....		17,240,000	6 cum	1	Aug., 1904
Barney & Smith	44	.....	June 1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	95	.....		2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	25¼	.....	April 6	14,862,000		.....	.....
Bethlehem Steel, pr	51⅞	— ⅛		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	37¾	+ ¼	March 16	45,000,000*	6	1½ S. A.	Feb., 1909
Cambria Iron	46	.....		8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	25½	— ½	Feb. 15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	40⅛	+ ⅝	Oct. 18	34,235,500		3½	April, 1902
Crucible Steel	8	— ⅛	Oct. 20	24,578,400		.....	.....
Crucible Steel, pr	62¾	+ ¾		24,436,500	7 cum	1 Q.	Dec., 1907
Empire Steel	6	.....	April 27	1,254,770		.....	.....
Empire Steel, pr	47	.....		2,500,000	6 cum	1½ S. A.	Jan., 1909
Fay & Egan	100	.....	Feb. 18	1,000,000	6	1¾ Q.	Nov., 1908
Fay & Egan, pr	100	.....		1,000,000	7 cum	1¾ Q.	Nov., 1908
General Electric	156½	+4	May 11	65,178,800	8	2 Q.	Jan., 1909
Harbison-Walker	17	—1½	Jan. 18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	84	— ⅞		9,600,000	6 cum	1½ Q.	Jan., 1909
International Pump	38⅞	+ ⅛	June 8	17,762,500		1	April, 1905
International Pump, pr	84⅞	+ ⅛		11,350,000	6 cum	1½ Q.	Feb., 1909
Lackawanna Steel	40	.....	March 10	34,971,400		.....	.....
Lake Sup. Corp	17⅞	+1⅛	Oct. 6	40,000,000		.....	.....
New York Air Brake	87⅞	+5⅜	June 17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	+3	Feb. 3	8,500,000	6	1½ Q.	Mar., 1909
Niles-Bement-Pond, pr	100	.....		2,000,000	6 cum	1½ Q.	Feb., 1909
Otis Elevator Co	50	.....	March 15	6,375,300		1½ S. A.	April, 1908
Otis Elevator Co., pr	94½	+ ½		6,295,000	6 n. c.	1½ Q.	Jan., 1909
Penn. Steel	50	.....	May 10	10,750,000		.....	.....
Penn. Steel, pr	104	.....		16,500,000	7 n. c.	3½ S. A.	Nov., 1908
Pittsburg Coal Co	12¼	.....	March 9	28,104,600		.....	Nov., 1906
Pittsburg Coal Co., pr	45½	.....		27,071,800	7 c.	1¾	April, 1905
Pressed Steel Car	41¼	— ¼	Feb. 17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	102½	— ½		12,500,000	7 n. c.	1¾ Q.	Feb., 1909
Pullman	171	.....	Nov. 10	100,000,000	8	2 Q.	Feb., 1909
Railway Stl. Spring	47	.....	March 4	13,500,000	4	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	101	+ ¼		13,500,000	7 cum	1¾ Q.	Dec., 1908
Rep. Iron & Steel	24	— ¼	Oct. 20	27,191,000		.....	.....
Rep. Iron & Steel, pr	85¾	+ ¾		20,416,900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	79⅝	+ ⅝	March 10	10,000,000	5	1¼ Q.	Mar., 1909
Sloss-Sheffield, pr	111	+1⅛		6,700,000	7 n. c.	1¾ Q.	Jan., 1909
U. S. Pipe & Fdy	28	—1¼	June 23	12,500,000	4	¼ Q.	Dec., 1907
U. S. Pipe & Fdy., pr	75	+ ⅛		12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	52⅝	+ ⅜	April 19	508,302,500	2 n. c.	½ Q.	Mar., 1909
U. S. Steel, pr	113½	+ ½		360,281,100	7 cum	1¾ Q.	Mar., 1909
U. S. Steel 5s	104⅛	+ ¼		463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	60	.....	Sept. 21	9,073,680		.....	.....
Westinghouse Elec	82¼	+2	June 16	27,173,200	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	111½	.....	Oct. 5	14,000,000*		2½ Q.	Jan., 1909

Par value of shares, $100, except those starred (*), $50.

Copper Stocks.

New York.—Amalgamated Copper closed 77½, a gain of 2¾.

Boston.—Butte Coalition closed 24¾, a net gain of 3¼; Calumet & Arizona closed 106½, a net gain of 1½; Calumet & Hecla closed 655, a net gain of 5; North Butte Mining closed 76¼, a net gain of 1⅞; Quincy Mining closed 92, a net gain of 2¼.

Financial Notes.

The Sloss-Sheffield Steel & Iron Co. declared a quarterly dividend of 1¼ per cent on common stock, payable March 1, thus advancing the rate from 1 per cent quarterly, which has been paid since last May, and restoring the stock to its former 5 per cent per annum basis. The National Lead Co. has declared the regular quarterly dividend of 1¾ per cent on preferred, payable Feb. 15.

NEWS FROM MANY INDUSTRIES

New Buyers:—

William Allen and J. Johnston, of Seattle, Wash., have filed articles of incorporation for the Western Malleable Iron Co. with a capitalization of $100,000.

The Broughton Bolt Co., Cleveland, has been incorporated with $50,000 capital stock, by John S. Broughton, J. J. Beeker, William F. Betz, George W. Greber and Dan Loew.

The Montana Bridge & Iron Co., Livingston, Mont., has been incorporated for $50,000 by A. H. Allen and associates. The company expects to engage in the erection of steel bridges.

The Eastern Iron & Supply Co., Bartlesville, Okla., has been granted a charter with $10,000 capital stock. H. L. Levy, A. Minsky, C. E. Fink and J. Fenburg are the directors.

The Wayne Engine Co., Fort Wayne, Ind., has filed application for a charter. The capital stock is $50,000, and the incorporators of the company are: Jacob M. Geoger, Edward F. Ferry and J. Y. Shoaff.

The Star Mfg. Co., Carpentersville, Ill., to manufacture tools and implements, has been chartered with $300,000. Those interested are Henry G. Sawyer, William G. Sawyer and John A. Waterman.

The Charles M. Besly Co., Chicago, general manufacturing, has been incorporated with $100,000 capital stock. Lewis M. May, James V. Cunningham and David B. Lyman Jr. are the incorporators.

M. E. Gray, James A. Byers and John D. Lynn, Rochester, N. Y., are the incorporators of the Rochester Can Co., Rochester, which was chartered to manufacture cans and metal goods, with $50,000 capital stock.

The Ralston Car Works, Ralston, Neb., has been granted a charter with $300,000 capital stock. The incorporators are Charles A. Ralston, George T. Ross, M. S. Dean, W. J. Lacey, William Hossman, H. H. Baldridge and L. Howard.

The Sterling Nail & Specialty Co., Chicago, has been incorporated to manufacture iron specialties and products, with $5,000 capital stock. The incorporators are: Edmund D. Adcock, Cornelius Lynde, and Ira Ryner.

A charter has been granted to the Inventors' Model Works, New York City, to manufacture machinery and tools, with a capital of $10,000. The incorporators are Clayton G. Hill, 24 Stone street; Harry F. Herman, 446 West 164th street, and William G. Busse, 500 Wales avenue, all of New York City.

The Lebett Mfg. Co., Matawan, N. J., to manufacture electric dynamos, motors, batteries, etc., with a capital of $300,000, has these incorporators: Roderic Wellman, J. Cotter Connell and Sara Likly, Matawan, N. J.

The Chemung Rolling Mill Co., Elmira Heights, N. J., rolling mill, has been granted a certificate of incorporation with a capital of $5,000. The incorporators are: Mathias H. Arnot, James B. Rathbone and Edward J. Dunn, Elmira, N. J.

The Loxit Motor-Lock Co., North Tonawanda, N. Y., to manufacture gas engines, steam engines, etc., has been incorporated with $40,000 capital stock. The incorporators are Pemberton Lundy, Samuel J. Elliott and George W. Forler, North Tonawanda, N. Y.

Articles of incorporation have been filed by the Constant Supply Co., 185 Dearborn street, Chicago, to manufacture machinery and mechanical devices, with $100,000. The incorporators are Clarence D. Fuller, Ada L. Ames and Robert P. Bates.

The Genesee Metal Co., Gates, N. Y., to smelt, refine and manufacture metals, has been granted a charter. The capital stock is $100,000, and the incorporators include Ernest C. Hazard, George R. Coates and Frederick W. Reidenbach, Rochester, N. Y.

A charter has been granted to the Custer Sandless Casting Co., which is capitalized at $10,000. The incorporators are: William J. Lotta, Chestnut Hill, Philadelphia; Edgar A. Vuster, 4101 Baltimore avenue, Philadelphia; and Ralph C. Lupton, Wilmington, Del.

The Lincoln Architectural Iron Co., Rockaway, N. J., to manufacture iron, steel and other metal products, with a capital of $25,000, has been incorporated by Francis P. McIntyre, 983 Madison avenue, Paterson, N. J.; John E. Neylon, Rockaway, N. J.; and James V. Beam, Boonton, N. J.

The Seaboard Supply Co., New York City, to deal in railroad supplies and equipment, with $10,000 capital stock, has been granted a charter through Henry O. Smith, 677 Lincoln place, Brooklyn, N. Y.; Thomas H. Low, 160 Broadway, New York; and C. G. Low, Edgewater, N. J.

Harry L. Graft, Inc., New York City, has filed application for a charter to manufacture machinery, motor and other vehicles, with a capital of $4,000. The incorporators are Harry L. Graff and Levi A. Graff, Bensonhurst, L. I.; Charles J. Flynn, 141 West Fifty-second street, New York City.

New Construction:—

The O. Han & Johnson Co., Wilmar, Minn., advises that its new foundry is complete and in operation, the necessary equipment for the present having been installed.

The Muhlenberg Machine Co., Dayton, O., has taken out a building permit to build a factory of its own on Edgar street. The building will be two stories, and of brick.

The Standard Tin Plate Co., Canonsburg, Pa., has let the contract for erecting four mills in addition to the present six mills at the plant, and for enlarging the tin house.

Centrifugal dust collectors, designed by Frank C. Roberts & Co., of Philadelphia, are being installed by the Roane Iron Co. at its furnaces in Chattanooga, and by Pickands, Mather & Co. at their Ella furnace in West Middlesex, Pa.

The F. W. Wyatt Mfg. Co., Salina, Kans., general foundry work, advises that it contemplates building a foundry just as soon as the weather will permit. It will be 50 x 120 feet, two stories, absolutely fireproof, to be built of reinforced concrete.

The Bonny-Floyd Casting Co., Columbus, O., which was organized and erected a new plant last year, has just completed an extension to its molding shop, 70 x 90 feet. The extension is now being placed in operation. The plant is in full operation.

Work on the erection of a roundhouse and shops at Brewster, O., will begin as soon as spring opens, is the announcement made by B. A. Worthington, receiver of the W. & L. E. Three steam shovels and four work trains are now preparing the site.

Regier Bros., Moundridge, Kans., are planning to occupy a cement building with a machine shop, 20 x 60 feet, which will be built the coming spring. The shop will be equipped with lathes, shapers, boring mill, etc., for doing a general line of machinery repair work.

Plans for the extensive enlargement of the Traverse City Iron Works, Traverse City, Mich., are being completed, contemplating the razing of the old building and the erection of a larger structure in its place. The Traverse City Iron Works was recently incorporated by three organiz-

ers—Benjamin Thirlby, William F. Calkins and Lawrence De Zoete, with a capital of $100,000. The company manufactures gas producer engines.

A. C. Elder, Watkinsville, Ga., has secured plans for rebuilding his machine shop recently destroyed by fire. The new structure will be 32 x 50 feet, fireproof, and will cost $2,500. Proposals for the building, and iron working machinery to be installed, were to be opened Feb. 15.

The Carborundum Co., Niagara Falls, N. Y., announces that it will erect an addition 60 x 225 feet, four stories, in which it will manufacture garnet paper and cloth as well as emery paper and cloth, thus broadening its line in the abrasive field.

The Enameled Steel Tank Co., Kalamazoo, Mich., which recently increased its capital stock from $60,000 to $120,000, has decided to build a cement building, 132 x 180 feet, two stories, on a recently purchased site. The building will be occupied by a brass foundry, enameling works, packing and shipping rooms.

The Benton Harbor Malleable Foundry Co., Benton Harbor, Mich., which recently increased its capital stock, advises that it is adding a new building 60 x 80 feet, and building new ovens to bring up its annealing capacity to 12 to 15 tons a day. The company has bought the material, and the work is nearly complete.

The Burns Boiler Co., Green Bay, Wis., high grade power and heating boilers, advises respecting the partial destruction of its plant by fire recently, that it is rebuilding and will be ready to resume operating March 1. The only damage done to the equipment was the loss of shafting, motors and belting, and these have been replaced.

General Industrial Notes:—

The National Adding Machine Co., Cleveland, has increased its capital from $200,000 to $500,000.

The Ironton Malleable Co., Ironton, O., has increased its capital stock from $150,000 to $200,000.

An increase of capital stock has been made by the Standard Adding Machine Co., St. Louis, from $300,000 to $600,000.

The Connersville Blower Co., Connersville, Ind., has filed notice of an increase of capital stock to $400,000 from $200,000.

The Wagner Electric Mfg. Co., of St. Louis, at its meeting last Wednesday, elected directors as follows: S. M. Dodd, Thomas H. West, James W. Bell, James Campbell, W. K. Bixby, W. A. Layman and Albert Blair. The board of directors met later and chose these officers: President, S. M. Dodd; first vice president and manager, W. A. Layman; second vice president, James W. Bell; secretary, Albert Blair; treasurer, W. S. Thomas; assistant secretary, M. S. Allcorn; assistant secretary, W. S. Thomas.

Torrence Parker, an attorney, has been named as temporary receiver for the Boston Bolt Works, Boston, Mass. Assets are placed at $60,000 to $65,000.

A bill of equity has been filed by the Real Estate Trust Co., Philadelphia, against the American Swedish Crucible Steel Co., formerly the Standard Iron Mining & Furnace Co. The plaintiff seeks to foreclose on a $2,500,000 mortgage which it holds as trustee.

Stockholders of the Halcomb Steel Co., Syracuse, N. Y., recently voted an increase of the capital stock of the corporation from $1,700,000 to $1,800,000. President H. S. Wilkinson is quoted as saying that the additional capital will be used in extending the business of the company.

Appraisers are at work on the real estate and personal property of the Capitol Lock, Nut & Washer Co., Columbus, O., which was placed in the hands of the receiver last fall. As soon as appraisement is completed, steps will be taken to ask for the sale of the property by the court, as no arrangements have been made for a re-organization of the company as yet.

The annual meeting of the stockholders of the Niles Steel Tool Works, Hamilton, O., resulted in the election of these officers: President, James K. Coullen; vice president, George T. Reiss; secretary, Joseph L. Blair; assistant secretary, Miles T. Watts, of Cincinnati, and assistant secretary, Lucius Potter, of Hamilton. The old board of directors was re-elected.

Stockholders of the Dayton Malleable Iron Co., Dayton, O., re-elected these directors at the annual meeting: Pierce D. Schenck, S. W. Davies, T. P. Laddis, E. T. Mathews, W. H. Cossell, J. Sprigg McMahon. The directors re-elected the following officers: President, and general manager, Mr. Schenck; vice president, Mr. Davies; treasurer, Rudolph Heinz.

The American Rolling Mill Co. has resumed the former basis of 10 per cent per annum in the payment of dividends on common stock, and the first quarterly dividend of 2½ per cent will be paid shortly. After the suspension of the Westinghouse Electric & Machine Co., of which the American company was a creditor to the amount of $170,000, the rolling mill company discontinued dividends on common stock. Under the Westinghouse re-organization, the American company's claims will be paid in full.

The Hoover Stove Casting Co., and the Blakesley-Tuttle Stove Co., Kansas City, Mo., have consolidated under the name of the Security Stove & Mfg. Co. The plant of the Hoover Stove Co., Seventeenth and Oakley streets, is to be enlarged and used for the manufacture of stoves, the office and distributing station of the new company to be at 1515 West Eighth street, in the west bottoms.

The stockholders of the Standard Boiler Plate & Iron Co., Niles, O., elected these officers and directors: President, C. T. Swaney; vice president, H. M. Unger; secretary and treasurer, D J. Finney, and manager, E A. Gilbert: G. A. Schaffner, F. W. Stillwagon and P. Gilmer. Manager Gilbert reported that the finances of the company are in good condition, and a number of orders on the books.

Stockholders of the Guerber Engineering Co., Bethlehem, Pa., at the annual meeting Jan. 26, elected these officers and directors: President, A. N. Cleaver; vice president, F. C. Staut; treasurer, William B. Myers; secretary, Franklin H. Bruner; manager, J. E. Boatrite; superintendent, E. Guerber; purchasing agent, superintendent of manufacture, A. D. Longaker: Owen F. Leibert, J. W. Adams, W. A. Wilber and Alan C. Dodson.

Stockholders of the Buffalo Co-operative Stove Co., Buffalo, elected these directors for three years: John S. Keener, Phillip Volz and Edward Keener. These officers were elected: Edward Breitwieser, president; vice president, Julius Deitz; secretary, John S. Keener, and treasurer, Ignatz Schiesel. Edward Keener was re-elected manager. This is the 25th year that the company has been making stoves and ranges in Buffalo.

In the chancery division of the High Court of Justice in London, Eng., Justice Joyce recently delivered a decision giving judgment for the defendants in the action brought by the Carnegie Steel Co. against Bell Bros, Ltd., and Dorman, Long & Co., Ltd. The action was brought to restrain an alleged infringement of the Monell process of steel manufacture, of which the Carnegie Co. is owner. The defendants denied any infringement, pleading that the patent was invalid by reason of anticipation and prior use.

Ellsworth E. Chapman, 544 West avenue, Spokane, Wash., has invented and is building a car-moving device

so designed that one may move from one to five freight cars at a time. The device consists of two side plates loosely bolted together which fit over the rail head; a top plate beveled so to act as a wedge between the side plates and cause them to clamp the rail when pressure is applied, carries the car-moving lever. The side plates are 2½ inches by 4½ inches. The device is made of steel and cast iron and weighs 24 pounds.

The Weber Gas Engine Co., Kansas City, Mo., advises that the recent fire destroyed its pattern storage building and a number of patterns contained therein. The loss has been satisfactorily adjusted. Although the company lost a number of live patterns, a great many of them were saved, and those lost are being rapidly replaced.

These officers of the American Roll & Foundry Co. were elected at the annual meeting Feb. 2: President, John W. Hubbard, of Pittsburg; vice president, William Gardner, Wilkinsburg, Pa.; treasurer and general manager, James O. Barnett, Canton, O.; secretary, P. A. Crist, Canton. The company's business was reported in prosperous condition, and the outlook for the future encouraging.

The American Specialty Co., of Chicago, has closed a contract with the High Speed Drill Co., of Dubuque, Ia., whereby it takes the entire output of the drill company, and becomes the exclusive agent for the complete line of the celebrated flat and flat twisted high speed drills. This line comprises machine shop, structural, blacksmith, ratchet, track drills, etc. These drills are radically different from the majority of high speed flat and flat twisted drills now in use, fit any standard of drill press, air drill, electric drill, ratchet, etc., without the use of special chucks of any kind. The entire line is also made with common straight shank.

The Chase Foundry & Mfg. Co., Columbus, O., at its annual meeting Feb. 6, elected these officers: President, P. A. Myers, of F. E. Myers & Brother, Ashland, O.; vice president, Guy C. Myers; general manager and secretary, S. M. Chase; superintendent, W. C. Stocklin. The company's line of goods has never been as modern and complete, meeting requirements for trucks and cars for almost every purpose. Advantage was taken of the dull times during the past year for increasing the company's facilities and installing modern methods of construction. Special attention has been given to the brick, stone and concrete equipment, and the outlook is reported most favorable for a large business during the coming year.

Trade Notes:—

Eastman Bros. & Russell, Dallas, Tex., have been appointed general selling representatives for Texas, Oklahoma and Arkansas by the Inland Steel Co., of Chicago. It is believed that both concerns and the general trade affected will be greatly benefited by this arrangement.

The Riter-Conley Mfg. Co., Pittsburg, steel construction, has established two new sales offices in the west; one in St. Louis, Third National Bank building, with H. B. Clarke as resident manager, and one in Seattle, Central building, with W. H. Dickinson as resident manager.

The Gisholt Machine Co., Madison, Wis., has opened its new Chicago display rooms at Washington boulevard and Desplaines street, second floor of the new Sharpe building, and extends a cordial invitation to all to inspect the line of Gisholt labor saving machine tools installed for demonstration.

Stanley G. Flagg & Co., Philadelphia, manufacturers of pipe fittings, malleable and small steel castings, have discontinued their representation in New York on a commission basis, and have taken over the office previously used by them, and are operating it as a part of their new sales department, with R. G. Williams in charge.

Fires:—

The machine department of the Oshkosh Boat Works, Oshkosh, Wis., was damaged to the extent of about $6,000, Feb. 9.

The plant of the Henderson Machine Co., Henderson, Ky., was seriously damaged Jan. 30, the loss being placed at $6,000, with $1,500 insurance.

TRADE PUBLICATIONS.

ELECTRIC PUMP GOVERNORS.—The Westinghouse Traction Brake Co., Pittsburg, is distributing instruction pamphlet No. T 5042, describing the construction of electric pump governors, their operation, regulation and adjustment, installation, maintenance, etc. The pamphlet comprises 18 5 x 7-inch pages.

SPACING TABLES.—The Standard Bridge Tool Co., Pittsburg, is distributing a 16-page 9 x 6-inch pamphlet, describing the Thomas spacing table. It is illustrated with photographs of actual installations, showing the various adaptations of this machine.

CHAINS.—An unusually handsome catalog has just been issued by the Seneca Chain Co., Kent, O. This comprises 80 11 x 8-inch pages, printed in two colors and splendidly illustrated. It is bound in an embossed cover, with a medallion of an Indian's head in colors. The subject matter of the catalog comprises chain tables, giving weights, sizes, proof tests and breaking strains and a number of different types of chains, including crane, dredge, stud link and other types. Descriptions of a great number of other chains are presented, together with illustrations and tables of weights, sizes and lengths. There is also a table of hooks, showing the dimensions and capacities of standard hoisting hooks.

CRUSHERS.—The Pennsylvania Crusher Co., Philadelphia, is distributing bulletin No. 512, illustrating and describing various types of crushers built by it.

BELT CONVEYORS.—Catalog D, issued by the Jeffrey Mfg. Co., Columbus, O., describes the Jeffrey "Century" rubber belt conveyors. Illustrations showing the construction of the conveyor and also actual installations are presented, together with tables of prices of various parts. The catalog comprises 48 6 x 9-inch pages.

AUTOMATIC SCREW MACHINES.—The National Acme Co., Cleveland, has issued a new general catalog of 92 7 x 9-inch pages, describing various Acme automatic and semi-automatic screw machines. The subject matter of the catalog comprises descriptions of the machines and their operations, being illustrated with complete detail and sectional views of the various types of machines. It also presents tables of capacities and sizes and illustrates the tools used and classes of work which can be made with the machine. It is handsomely printed in three colors on coated paper and bound in flexible boards.

SEAMLESS STEEL TUBES.—The National Tube Co., Pittsburg, has issued a handsome catalog 8 x 10 inches, 45 pages, describing the process of making Shelby seamless steel tubes. The subject matter of the catalog is largely the same as that which appeared in an article on seamless steel tubes in THE IRON TRADE REVIEW of Nov. 19. The catalog is handsomely illustrated and details the process of manufacture from beginning to end.

LARGE NUTS.—The Milton Mfg. Co., Milton, Pa., has issued a booklet describing special large nuts manufactured by this concern.

BOOKS.—The Norman W. Henley Co., 32 Nassau street, New York, has issued a catalog of books for use in engineering and allied trades.

SPRAY PUMPS.—The Deming Co., Salem, O., is distributing a two-color catalog, illustrating spray pumps, nozzles and appliances. These pumps are of advantage in whitewashing mills, factories, warehouses, etc.

OIL BURNING APPARATUS.—Tate, Jones & Co., Inc., Pittsburg, have issued an attractive booklet entitled "Oil vs. Coal," describing fuel oil burning apparatus manufactured by this company. The principle of operation of the burner is described, and illustrations are presented of heating furnaces, portable forges, steel melting furnaces, etc. Bound in with the pages of the catalog are fly leaves printed in colors, showing the application of this company's product in various shops among which are those of the Seaboard Air Line railway and Pennsylvania lines, the Westinghouse Air Brake Co., and others. The booklet comprises 16 pages, 6 x 9 inches.

MOLD DRYERS.—The Hanna Engineering Works, 820 Elston avenue, Chicago, is distributing a circular illustrating its portable mold dryer, comprising a fan and air heater using a coke fire and a distributor, whence the air is distributed to all parts of the mold.

PIPE MACHINES AND BOLT CUTTERS

Loew-Victor power pipe machine, cap. 1" to 4", NEW.
Loew-Victor No. 1 pipe machine, cap. ¼" to 2", NEW.
Loew-Victor No. 2 pipe machine, cap. 1" to 4", NEW.
Loew-Victor No. 3 pipe machine, cap. 1¼" to 6", NEW.
Jerecki No. 10 pipe machine with engine, cap. 1" to 4".
Peerless improved pipe machine, cap. ¼" to 2".
4" Borden hand power pipe machine, cap. 1½" to 4".
2" Cox & Son pipe threading and cutting off machine.
National double head bolt cutter, cap. up to ⅝".
Merriman No. 2 patent bolt threading machine.
Borden hand power pipe threading machine, cap. 1½" to 6".
Pittsburg "B" pipe attachment for ¼" to 5½" pipe, NEW.
Schlenker No. 4 double head bolt cutter.

WICKES BROTHERS
117-119 Fourth Avenue PITTSBURG, PA.

Frogs & Switches

ALSO

LIGHT RAILS, SPLICE BARS, SPIKES & BOLTS, SWITCHSTANDS, RAIL BRACES,

Quick Shipments of Short Orders.

CAR PUSHERS, DERAILERS, HEAVY CHAIN, PLATES 12' to 36' CUT TO SKETCH.

CENTRAL TRACK SUPPLY COMPANY, Springfield, O.

FOR SALE

1—48" x 21' Putnam Triple Geared Engine Lathe, Used six months.
1—12" Niles Late Improved Slotter, used three months.
1—42" x 42" x 8' Detrick & Harvey Open Side Planer. Used three months.
1—14" x 14" Hall Duplex Belt Driven Compressor, 650 cu. ft. Good condition.
1—10 x 10 x 10 Laidlaw-Dunn-Gordon Compressor. Used six months.
1—40" Betts Vertical Boring Mill. Fine condition.

WM. WARD MACHINERY CO., 601 House Building Pittsburg, Pa.

SECOND HAND MACHINERY

1—Egan Co. Wood Frame Dado Machine with six (6) Heads and 2 Saws; good as new.
1—5 H. P. Crocker-Wheeler, Direct Current Motor, 120 Volts, 1800 R. P. M. Good as New.
1—New No. 4½ Clement double surfacer with sectional rolls, for immediate delivery.
1—8" Clement Hand Jointer or Buzz Planer.
1—Double spindle routing machine, fair condition.
1—48 in. J. A. Fay & Egan Co. No. 4 latest improved three-drum sander, good as new.
1—24 in. J. A. Fay & Egan Co. No. 2 hand planer and jointer, good as new.
1—Rowley & Hermance Co. No. 5 double door sticker, good as new.
1—Egan single spindle boring machine with table.
1—Egan double spindle boring machine with table.
1—16 in. x 20 in. 100 H. P. Heavy Duty Steam Engine, entirely rebuilt.
1—7½ x 7 x 10 in. Worthington Low Service Duplex Pump with Submerged Cylinders.
1—8 x 10 in. Left-hand Chandler & Taylor Self-contained Engine.
1—15 H. P. Horizontal Engine.
1—3 in. Waters Engine Governor.
1—Houston Sash Dovetailing Machine. Good as new.
1—Houston Power Feed Panel Raiser.
1—18" second hand shaper.
1—18" second hand cupola blower.

We also have a full line of second-hand Woodworking Machinery.

Aumen Machinery & Supply Co.
324 N. HOLLIDAY ST. BALTIMORE, MD.

p

REFITTED SECOND-HAND MACHINES

BORING MACHINES
(1) 2B Binsse Horizontal
(2) 30 in. Bullard
(1) 37 in. Bridgeport—(1) head

DRILL PRESSES
(1) 4-spindle Reed sensitive
(1) 6-spindle Quint turret
(1) 33 in. Bement-Miles

DRILL PRESSES—RADIAL
(1) 24 in. Fosdick, National type

GEAR CUTTERS
(1) Grant-Lees hobbing machine
(1) 30 in. x 8 in. Brainard spur
(1) 36 in. x9 in. x5p Gould & Eberhardt
(2) 50 in. x11 in. x3p Gould & Eberhardt

GRINDERS
(1) No. 2 Brown & Sharpe Universal
(2) Cincinnati cutter and tool
(1) "A" Yankee Drill Grinder
(1) Leland & Faulconer, wet
(1) 12 in. Disc Grinder

HAMMERS
60 lb. Bradley, cushioned helve

LATHES
(1) 14 in. x 6 ft. Prentice, taper att.
(1) 14 in. x 6 ft. Whitcomb-Blaisdell, quick ch'ge gear, turret on shears
(1) 14 in. x 6 ft. Le Blond, quick change gear
(1) 14 in. x 6 ft. Le Blond, belt feed
(1) 14 in. x 8 ft. Flather
(1) 16 in. x 6 ft. Reed, belt feed, plain rest
(2) 16 in. x 6 ft. Lodge & Shipley quick change gear
(1) 18 in. x 6 ft. Lodge & Shipley, quick change gear
(1) 20 in. x 8 ft. Flather, comp. rest
(1) 20 in. x 12 ft. Le Blond, belt feed
(1) 22 in. x 10 ft. Lodge & Shipley, quick change gear
(2) 22 in. x 12 ft. Lodge & Shipley, quick change gear
(1) 22 in. x 12 ft. Walcott
(1) 24 in. x 8 ft. Flather
(1) 24 in. x 10 ft. Lodge & Barker
(2) 24 in. x 12 ft. Lodge & Shipley, quick change gear
(1) 24 in. x 16 ft. Lodge & Shipley, quick change gear
(1) 26 in. x 12 ft. Reed
(2) 27 in. x 10 ft. Lodge & Shipley, quick change gear
(1) 27 in. x 14 ft. Lodge & Shipley, quick change gear

LATHES—POLISHING
(2) No. 5 Diamond, 52 x 1 1-4 spindle
(2) No. 7G Diamond, 48 x 1 1-4 spindle

MILLING MACHINES
(1) No. 1 Brainard Universal
(1) No. 15 Becker-Brainard Universal
(1) No. 3 Brown & Sharpe Universal
(1) No. 3 Cincinnati, all feeds, plain
(1) No. 4 Cincinnati, all feeds, plain
(1) 42 in. x 24 in. x 8 ft. Ingersoll, slab

PLANERS
(1) 10 in. Bush crank
(1) 20 in. x 20 in. x 4 ft. Wheeler, 1 head
(1) 26 in. x 26 in. x 10 ft. Powell, 2 heads
(1) 36 in. x 36 in. x 10 ft. Gray, 2 heads
(1) 42 in. x 36 in. x 14 ft. Cincinnati, 2 heads

PRESSES
(1) D75 Ferracute
(1) No. 62 Toledo
(1) No. 8 Greenard arbor

SAWS
(1) 3 1-2 in. Burr
(1) 6 in. Cochrane-Bly
(1) 6 in. Newton
(1) Miller-Falls Hack
(1) 26 in. Crescent band

SHAPERS
(1) 14 in. Lodge & Davis
(1) 16 in. Stockbridge, back geared
(1) 16 in. Gould & Eberhardt
(1) 18 in. Steptoe
(1) 20 in. Hendey
(1) 24 in. Walcott, shifting belt
(2) 24 in. Gould & Eberhardt
(1) 24 in. Hendey
(1) 24 in. Potter & Johnson
(1) 26 in. Cincinnati, triple geared
(1) 28 in. Hendey
(1) 32 in. Gould & Eberhardt

TURRET LATHES
(1) No. 3 Bardons & Oliver
(1) No. 5 Warner & Swasey
(1) 2 in. x 24 in. Jones & Lamson
(1) 2 in. x 26 in. Pratt & Whitney
(1) 22 in. Bullard "B" machine
(2) 22 in. Lodge & Shipley, 4 inches through spindle
(1) 16 in. Universal

THE MOTCH & MERRYWEATHER MACHINERY CO.
707-715 Lakeside Ave. N. W., Cleveland, Ohio
Detroit Br'ch: 1025 Majestic Bldg. Cincinnati Br'ch: 1014 1st N't'l B'k Bldg

COMPLETE LIST CAN BE HAD FOR THE ASKING

LATHES
84 in. x 40 ft. Putnam
36 in. x 12 ft. Putnam, rod feed
32 in. x 58 in. x 16 ft. rod fd. Gap Lathe
30 in. x 14 ft. Fifield. 24 in. x 14 ft. Betts
24 in. x 9 ft. Pond, rod feed
20 in. x 13 ft. Betts 20 in. x 8 ft. Betts
20 in. x 8 ft. Pond, rod feed
19 in. x 6 ft. Pond
18 in. x 8 ft. Wood & Light
Complete stock of 16 in. x 8 ft., 14 in, x 6 ft. and 12 in. Lathes on hand

PLANERS
84 in. x 84 in. x 27 ft. Lowell, 2 heads
84 in. x 84 in. x 24 ft. Putnam, 1 head
37 in. x 33 in. x 10 ft. Bement
36 in. x 36 in. x 18 ft. Niles, 4 heads
36 in. x 36 in. x 17 ft. Sellers
30 in. x 30 in. x 12 ft. Bement, 2 heads
24 in. x 24 in. x 6 ft. Lathe & Morse
Several 15 in., 16 in. and 18 in. Planers on hand

SHAPERS
20 in. x 20 in. Fedrick & Ayer, open side
18 in. Hendey. 18 in. Ohio
18 in. Ohio. new. 16 in. Ohio, new
16 in. Pratt & Whitney
13 in. x 22 in. English, traveling head
9 in. x 26 in. Sellers. 16 in. Juengst
Several small Shapers carried in stock

HAMMERS
2500 lb. Morgan, Double Frame
1000 lb. Chambersburg Steam Drop
800 lb. Pratt & Whitney Board Drop
400 lb. Merrill
250 lb. Morgan, Steam
50 lb. Morgan, Steam
No. 2 Hawkeye Trip. No. 0 Dupont
Williams & White No. 4 Riveter

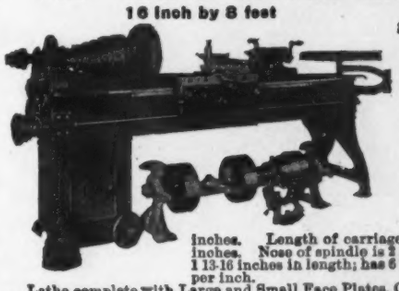
SLOTTERS
12 in. New Haven
10 in. Lowell 6 in. Hewes & Phillips

MISCELLANEOUS
No. 5 Cincinnati Double End Punch and Shears, 8 in. Throat
10 in. x 30 in. Iroquois full Uni. Grinder
No. 11 Higley Cold Saw
8 22 Ferracute Forging Press
4½ in. x 48 in. Burr Shaft Keyseater with Routing Attachment
52 in. Bement Boring Mill
48 in. Hor. Boring Mill
60 in. Harrington Pulley Borer
Two 30 in. Bullard Vertical Turret head Boring Mills
Full stock of Presses, both new and second-hand. No. 4 Hibbard P'ch Press

FRANK TOOMEY, 127-131 N. Third St., Philadelphia, Pa.

"G.M." SOREW CUTTING ENGINE LATHE

16 inch by 8 feet



DIMENSIONS

Swings over shears 16 1-4 inches. Swings over carriage 10 1-4 inches. Takes between centers 4 feet 10 1-2 inches. Diameter of hole through spindle 1 5-16 inches. Size of front bearing of spindle 2 9-16 inches diameter by 4 1-2 inches long. Size of rear bearing of spindle 2 3-16 inches diameter by 3 inches long. Traverse of compound rest 4 3-4 inches. Length of carriage bearing on shears 23 inches. Nose of spindle is 2 1-4 inches in diameter, 1 13-16 inches in length; has 6 U. S. Standard threads per inch.

Lathe complete with Large and Small Face Plates, Compound Rest, Steady Rest, Power Cross Feed Change Gears. Splined Screw with interlocking device for belt or gear drive. Wrenches, Large Cabinet Leg and Friction Countershaft. Weight 1,750 lbs.

Manufactured by

The G. M. Lathe Company, Lennox Bldg. CLEVELAND, O.

CLASSIFIED ADVERTISING SERVICE

Advertisements for "Positions Wanted" and "Positions Vacant" inserted at the rate of 50 cents for 50 words or less, additional words 2 cents each. All other advertisements under classified headings 15 cents a line for each insertion.

POSITIONS VACANT.

WE WANT TO ATTRACT THE ATTENtion of a successful man, capable of business management and unlimited executive ability, with knowledge of directing sales department and willing and able to grasp the fundamental principles of the mechanical rubber business. The rubber industry is developing faster than men are being developed for it and you know what this means and its value to you. This company is one of the largest and most progressive in the U. S. All communications strictly confidential. Address Rubber, Box 102, care THE IRON TRADE REVIEW, Cleveland, O.

POSITIONS WANTED.

ENGINEER WITH EXPERIENCE IN ALL departments of open-hearth steel manufacture wishes change of position. Have been with present interests eight years, having had charge of engineering, construction, railroad operation, purchasing. Also experienced in costs, general management and sales. Have devised labor saving machines and methods and can get results. Address Box 406, THE IRON TRADE REVIEW, Cleveland, O.

BLAST FURNACE SUPERINTENDENT or manager, energetic, experienced, up-to-date. At present engaged, but open for early engagement. Can make old plants produce satisfactory results. Medium sized or large furnaces. Mechanically, or hand filled, merchant or steel works product. Address "Capable," care THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED. ENGINEER OF established reputation, wide experience apprentice to works manager, intimate knowledge of best shop and machine tool practice on heavy work, gilt-edged record, is open for engagement as works manager with full responsibility and can deliver the goods. Address Box 399, THE IRON TRADE REVIEW, Cleveland, O.

POSITION WANTED BY AN EXPERIenced foundry man, up-to-date in all the different branches of a foundry, light and heavy castings, 39 years old, not afraid to work. Address Box 58, PENTON'S LIST, Cleveland, Ohio. p.

WITH RECORD OPEN TO INVESTIGAtion as superintendent of large gray iron plants producing a variety of light to medium heavy castings in gray iron, a new connection is desired. Familiar with modern practice in melting, molding machinery, labor saving devices, etc. References furnished. Address Box 407, THE IRON TRADE REVIEW, Cleveland, Ohio.

SALESMAN, PRACTICAL MAN OF 30, having held the following positions within the past 12 years, with large concerns in the steel, malleable and gray foundry business, is open for an engagement as sales manager, purchasing agent, cost clerk, paymaster, foundry order clerk and salesman, having traveled the past five years from Maine to Kansas City. Address Box 52, PENTON'S LIST, Cleveland, Ohio. p.

AS TRAVELING SALESMAN WITH A manufacturer. Am personally acquainted with the wholesale hardware and iron, plumbing and mill supply trade of the United States. Will take any territory. Address F. W. Peters, 3647 Botanical avenue, St. Louis, Mo.

POSITION WANTED BY AN ASSIStant foundry foreman, energetic and ambitious, having practical knowledge of foundry work, cupola practice, mixing metals and molding machines, capable of advancement. Address Box 54, PENTON'S LIST, Cleveland, O. p.

POSITION WANTED AS FOREMAN BY young man, 17 years' experience at the trade on loam, dry and green sand; familiar with cupola practice. Address Box 60, PENTON'S LIST, Cleveland, O. p.

BUSINESS OPPORTUNITIES.

GRAY IRON FOUNDRIES. WRITE ME if you want to add to your business a patented specialty that is a winner. Enormous sale and pleasing profits. Royalty contracts preferred in all unoccupied territory. Address F. E. Miller, 109 Pa Ave., Lansing, Mich.

FOR SALE. FIVE THOUSAND DOLlars in common and five thousand dollars in 7 per cent preferred, treasury stock in good foundry proposition. Been in operation three years, established trade, big profits. Prefer investor with experience and capable of taking a hand in management. Address Box 408, THE IRON TRADE REVIEW, Cleveland, O.

SMALL FOUNDRY AND MACHINE SHOP in northwest Pennsylvania wishes to correspond with responsible, practical man with suitable meritorious article to manufacture, who can market the goods. Plant in good shape and great opportunity for right man to buy or acquire working interest. Open for any fair proposition. Address Box 59, PENTON'S LIST, Cleveland, O. p.

FOR SALE, SEVEN THOUSAND FIVE hundred dollars' worth of stock in a new foundry and machine shop in railroad town of 11,000, near smelters and other manufacturing plants, in the oil and gas field—gas two and three cents a thousand. Employ as many as 12 molders. Good reasons for selling. Address Box 57, care PENTON'S LIST, Cleveland, Ohio. p.

NEW AND UP-TO-DATE FOUNDRY AND machine shop for sale, with patterns, patents, etc., for 15 woodworking machines of the latest designs, or would sell one-half interest to a live business man. Address Box 66, Mount Morris, N. Y. p.

WANTED PARTY WITH A FEW THOUsand dollars to join me in exploring iron property on Mesabi iron range. R. B. Higbee, Germania Life Bldg., St. Paul, Minn.

STRICTLY MODERN GRAY IRON FOUNdry for sale, completely equipped and in daily operation on profitable machinery work. Located in Michigan town with excellent shipping facilities. Best of reasons for selling and will make liberal terms. Full information cheerfully furnished. Address Box 338, THE IRON TRADE REVIEW, Cleveland, O.

ENGINE FOR SALE.

FOR SALE—ONE 23 X 60 SINGLE CYLinder, double acting, Harris Corliss, pendulum ball governor, with section cast iron fly wheel, 18 ft. x 38". Good order, requirements changed, electric power being used. Address Almond Mfg. Co., Ashburnham, Mass. p.

FOR SALE: FIVE MILES 35-LB. RElaying rails. One Atlas-Corliss engine, 600 H. P. One 50-ton Bucyrus steam shovel. Locomotive and tubular boilers, all sizes, and all kinds of machinery. We make a specialty of handling wire cable up to 1¼" No. 1 second-hand condition. Your correspondence we solicit. Lake Superior Iron & Metal Co., Hancock, Mich. p.

FOR SALE AT A BARGAIN, ONE 30 H. P. double steam engine and 40 H. P. boiler, also two portable steam boilers, one 10 horse, one 12 horse, locomotive style, suitable for heating small buildings. For particulars and price inquire of H. A. Keen, North McGregor, Ia. p.

ONE HAMILTON CORLISS ENGINE for sale, 125 H. P., good condition. Address Western Iron & Foundry Co., Wichita, Kansas.

FURNACE FOR SALE.

ONE NO. 4 CASE HARDENING FURnace for sale, manufactured by the American Gas Furnace Co., of Elizabeth, N. J. The furnace has never been used. Address A. L. Sanger, Purchasing Agent, the C., H. & D., Cincinnati, O. p.

WASHERS "SPECIAL SIZES."

In any quantity, metal or fibre. Dies, Stamping and Screw Machine Work. Quadriga Mfg. Co., 18 So. Canal St., Chicago, Ill. p.

FOR SALE, MISCELLANEOUS

FOR SALE CHEAP. LATHE-BED PIPE machine, brand new. The Loew Mfg. Co., Cleveland, O.

ONE ESPEN-LUCAS PLAIN SLAB MILLing machine for sale, diameter of spindle 4 in.; width of table 18 in.; length of feed to table 48 in. Will admit work 22 in. wide. Has variable automatic feed ½ in. to 7 in. per minute. Screw for adjusting spindle head has micrometer adjustment. Condition good as new. Will be sold at a bargain. Graham Nut Co., Pittsburg, Pa.

PATENT FOR SALE. A NEW NAILless horseshoe, very useful. Anyone desiring to buy such patent, address or call on Adam Gimbut, 31 W. 14th place, Chicago, Ill.

FOR SALE, BALANCE WHEEL 70" diameter, 14" face, 6 7/8" bore, rim 2½" thick, weight 2,800. Cast iron pulley, 70" diam., 14" face, 6 7/8" bore, rim 1" thick, weight 1,500. Sturgis Machine Co., Sturgis, Mich. p.

PURITAN PAINT & OIL CO., INC., ALlegheny, Pa., manufacturers of technical paints, varnishes and Japan dryers, protective coatings for the protection of iron, steel and wood. Red lead and graphite paints, pure putty and barrel paints, red oxide and machinery paints sold in bulk only, for large consumers. p.

FOR SALE: TABOR VIBRATOR MOLDing machine, 7" power rammer, cost $290. Make us an offer. Chicago Hardware Foundry Co., North Chicago, Ill. p.

FOR SALE—1 30" POST DRILL, WITH countershaft, $10. One 25" post drill, $5. Two motors, 220 volts, 2.5 amperes, 1-2 H. P. 1600 R. P. M. One motor, 110 volts, 5 amperes, 1-2 H. P. 1600 R. P. M. One motor, 220 volts, 20 amperes, 5 H. P. 1250 R. P. M. The W. W. Sly Mfg. Co., Cleveland, O. p.

FOR SALE, BOILER COMPOUND OUTfit, consisting of 1,500-gallon steel steam jacket tank, one 2,000-pound portable drop lever, one 23 x 32 Howe scale, complete with appliances, 10 H. P. boiler, boiler compound formulas, etc. Address Acme Engineering & Construction Co., Milwaukee, Wis. p.

FINE GRAY IRON CASTINGS MADE TO order, of best workmanship and material. Send specifications and let us quote you prices. Address Altern's Foundry & Machine Works, Lancaster, O. p.

SCRAP WANTED.

TAKE NOTICE. WE ARE BUYERS OF all grades of scrap metals, such as scrap copper, brass, lead, babbitt metals, factory metal skimmings, drosses, metal clippings, spelter, etc. Advise quality and quantity you have on hand to offer and we will name best prices f. o. b. your city. H. Kander & Co., Bowling Green, Ohio.

WANTED, MISCELLANEOUS.

WANTED, SECOND-HAND 2" SIZE, BELT driven pipe threading machine. Preferably E. C. & B. make. Must be in first-class working order and unbroken. Room 302 at 313 Sixth Ave., Pittsburg, Pa. p.

WANTED, ONE 20 OR 22" DRILL PRESS, also one emery grinder with countershaft, both second-hand. Please state condition and price of each, also maker's name. Emery grinder must swing 16" wheel. B. Barrett's Sons, Wooster, O. p.

WANTED, AN 85 TO 100 H. P. ENGINE for belt connection to 55 K. W. generator that will work in a space of 6 to 8 ft. in width and 10 to 15 ft. in length—a Russell, Buckeye or Ideal preferred. L. H. Shepherd Milling Co., Charlottte, Mich. p.

CHEMISTS, ASSAYERS, SAMPLERS OF ORES, ETC.

ORES SAMPLED, TESTED AND ASsayed. Analysis of ores, fuels, limestone, iron and steel, clay and cements. Ethelbert Ely, Dover Laboratory, Dover, N. J. Established 1868.